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PRENATAL CARE

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PRENATAL CARE

BY

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VOLUME I

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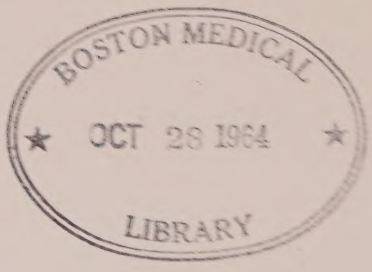

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PREFACE

Inasmuch as this volume is intended primarily for those in the general practice of medicine who in the course of such practice have the care of the greater number of expectant mothers—largely too in small communities inaccessible perhaps to the specialist—we have endeavored to make our suggestions as simple and as practical as possible.

This is not intended as a general textbook and, therefore, does not discuss at length the many points in obstetric technique that such a text would consider. It deals first and last with the preventative side of maternity protection.

Our purpose, then, may be summed up in the endeavor to emphasize the great need for improved care of the parturient woman and to indicate, incompletely to be sure, at least some of the methods by which infant and maternal mortality and morbidity may be lessened.

Ralph W. Lobenstine,
Harold C. Bailey.

PUBLISHERS' ANNOUNCEMENT

The publishers take pleasure in presenting to the medical profession the series of monographs of which this volume forms a unit.

The many inquiries which reached them proved, in advance of publication, that the work should be in monographic form and clinical in its presentation.

The series when completed will, they believe, be the most useful for the audience for whom it is written, the general practitioner of medicine, that has been presented in its particular field.

The authors are all men of wide experience and, in the main, teachers. The combination makes the work authoritative and of the utmost service in a field which has been often termed a "therapeutic specialty."

CONTENTS

CHAPTER		PAGE
I.	The Need for Prenatal Care	1
II.	The Essentials of Prenatal Care	15
	Examination of the Patient	17
	History	17
	Medical Examination	17
	Pelvic Examination	18
	Urine Analyses	21
	Blood-Pressure	22
	Diet	22
	Rest	24
	Exercise	24
	Intestinal Tract	25
	Medical Complications	25
	Early Nausea and Vomiting of Pregnancy	25
	Tuberculosis Associated with Pregnancy	26
	Heart Disease and Pregnancy	29
	Pyelitis	34
	The Toxemias of Pregnancy	36
	Disorders of the Nervous System	39
	Pelvic Tumors	41
	Abortion	44
	Intra-uterine Death of the Fetus	48
	Hemorrhage during the Second Half of Pregnancy	50
	Gonorrhea during Pregnancy	61
III.	Syphilis in Pregnancy	63
	Frequency	63
	Transmission of the Infection	64
	Hereditary Syphilis	66
	Pathological Manifestations	68
	Placenta	68
	Bones and Cartilage	70
	Viscera	73
	Spleen	75
	Skin	75
	Mucous Membranes	75
	Teeth, Eyes and Ears	76
	Maternal Syphilis	76
	Symptomatology	76

CHAPTER PAGE

The Results of Syphilis 78
Abortions and Miscarriages 78
Premature Labor and Stillbirth 79
Neonatal Deaths 79
Treatment 80
During Pregnancy 80
Congenital Syphilis 83
Conclusion 84

IV. Infections During Labor and in the Puerperal Period . . 86
Bacteriology 87
Pathology 88
Frequency 90
Predisposing Causes 91
Symptomatology 93
Treatment 95
Hygiene 95
Preparation of the Patient 95
Repair of Lacerations 97
Drainage 97
General Treatment 98
Local Treatment 98
Specific Treatment 99
Protein Therapy 103
Transfusion 103
Chemical Treatment 104
Operative Treatment 104
Conclusions 105

V. Induction of Premature Labor 106
Maternal Indications 106
Fetal Indications 107
Methods of Inducing Premature Labor 108

VI. Intrapartum Birth Injuries 111
Head Injuries 112
Injuries to Spinal Cord and Vertebræ 117
Injury to the Extremities 121
Nerve Injuries 124
Conclusion 128

VII. Shock Following Accidents of Labor 130
Primary Shock 130
Secondary Shock 133

VIII. Early Neonatal Management and Nursing 136
Care of the Infant 136
Idiopathic Hemorrhagic Tendency in the Newborn 138
Nursing 139
Mastitis 147

CHAPTER PAGE

IX. Prenatal Care from the Public Health Standpoint . . . 149
Protection of Mother and Child 150
Need of Improvement in Medical Care 150
Position of the Midwife 151
Position of the Hospital, Lay Organization, and Nurse . . 154
Doctors' Duties at the Prenatal Clinic 160
Advice for Mothers 161
Clothes for a Pregnant Mother 162
Diet 164
Constipation 166
Teeth 166
Kidneys 166
Skin 167
Rest 167
Exercise 168
Varicose Veins 168
Danger Signals of Pregnancy 168
Supplies for the Mother for Labor 170
Baby's Clothes and Supplies 171
The Care the Baby Needs 173
Bathing 174
Rest 174
Fresh Air 174
Regular Habits of Bowels 174

Index 177

ILLUSTRATIONS

FIGURE		PAGE
1.	Source of patients cared for by Maternity Center Association	13
2.	The so-called bear walk or monkey trot	20
3.	Multilocular dermoid cyst of the ovary and pregnancy	43
4.	Multiple myomata of the uterus and early pregnancy	44
5.	Diagrammatic illustration of multiple myomata and pregnancy	45
6.	Diagrammatic illustration of multiple myomata and pregnancy	46
7.	Pedunculated myoma of the uterus and pregnancy	51
8.	Central separation; concealed hemorrhage	52
9.	Apparent hemorrhage; partial separation. Head unengaged	53
10.	Head filling lower uterine segment, preventing escape of blood	54
11.	Complete separation. Distended atonic uterine wall becoming thinner	57
12.	Placental insertion. Low insertion of placenta	58
13.	Placental insertion. Placenta prævia lateralis	59
14.	Placental insertion. Placenta prævia marginalis	59
15.	Placental insertion. Placenta prævia totalis or centralis	59
16.	Placental insertion. Placenta prævia cervicalis increta	59
17.	Incidence of positive Wassermann reaction in adults	65
18.	Incidence of positive Wassermann reaction in pregnant women	69
19.	Microscopic section of normal placenta	70
20.	Microscopic section of syphilitic placenta	71
21.	Specimen of normal bone, and, on the right, diseased bone showing necrosis and irregularity at the epiphyseal line	72
22.	Syphilis at epiphyseal junction of femora. Spirochetes seen in the diseased bone	73
23.	Syphilis at the femur with typical irregularities at the epiphyseal junction (Wagner's line)	74
24.	Puerperal sepsis	92
25.	Puerperal sepsis	100
26.	Puerperal sepsis	102
27.	Asynclitism with overlapping of the parietal bones	114
28.	Diagrammatic outlines of head and septal system of dura mater	115
29.	Complete bilateral tear of the tentorium cerebelli	116
30.	Complete tear of tentorium cerebelli, elliptical tears of falx cerebri	118
31.	Forceps delivery with hemorrhages at the base of the brain and the upper part of the spinal canal	119

FIGURE PAGE

32. Forceps delivery with hemorrhage in the spinal cord in area from seventh to fifth cervical vertebra 122
33. Metal frame with extension arm for treatment of fractures in the newborn 123
34. Baby tied to frame with arm in the cast 123
35. Sections showing nerve injuries 126
36. Secondary shock. No hemorrhage. Ruptured lower uterine segment. Gum glucose administered 132
37. Secondary shock. Hemorrhage. Complete rupture of uterus with intraperitoneal hemorrhage. Gum glucose administered . . . 132
38. Primary shock, excessive hemorrhage, inversion of the uterus . . . 133
39. Secondary shock, postpartum hemorrhage with retained placenta . . 134
40. Gum glucose infusion apparatus devised at the Woman's Hospital, New York 135
41. Electric breast-pump 144
42, 43. Views of garters hung from shoulders when corsets are not worn 163
44. Ideal maternity corset 164
45. Treatment for varicose veins of leg 167
46. Treatment (postural) for varicosities of the vulva 168
47. Teaching exhibit as used by Maternity Center Association . . . 173

PRENATAL CARE

CHAPTER I

THE NEED FOR PRENATAL CARE

In the consideration of this subject it is important to bear in mind, that we are dealing with a relatively new field and one, therefore, that calls for much study. Such investigation should be carried out in a spirit of broadmindedness and freedom from bias. Numerous attempts are to-day being made to fathom some of the mysteries associated with procreation and to warrant certain definite conclusions regarding the causes of a high maternal and infant mortality.

The study, then, of how best to protect the expectant mother and bring normal children into the world and how to save both of these from invalidism, offers a field of the widest medical and social interest and one that, in this country at least, is of late meeting with marked popular support.

Progress, however, is bound to be slow, owing to widespread ignorance on public health matters and very noticeably so in all matters pertaining to motherhood.

Motherhood has so long been taken for granted and for so many centuries has received such inadequate attention because of its supposedly natural and normal course that, alas, popular ignorance has been allowed to continue regarding the many really serious conditions commonly seen during pregnancy or labor. It is foolish to deny the fact that modern life does not predispose to either a physiological pregnancy or an easy labor; quite the contrary is true.

The astounding nervous unrest of the age and the great increase in the use of tobacco and alcohol by young women play their part in changing a physiological process into a pathological one.

Students of medicine will recall, I am sure, the great stress placed upon the pathology of pregnancy and upon the various operative procedures, and at the same time the almost universal failure, in the textbooks, to stress the "preventative side."

It has only been in most recent years that increasing interest has manifested itself in respect to the great value of prenatal care systematically practiced either by the individual physician, by hospital clinics, or by special organizations engaged in this form of welfare work.

Accurate statistics of public health results have been particularly difficult to obtain in this country because of the large territories that have failed until recently to be included in the United States Census for births and deaths and furthermore because of wide variation in methods of tabulation.

As an illustration of this, we need but to refer to the last published report by the Bureau of the Census to learn that as late as the year 1922 the birth registration area included only thirty states and the District of Columbia, and that the estimated population for this area was 79,952,425 or 72.2 per cent of the total estimated population of the United States. The number of births exclusive of stillbirths registered was 1,792,646. According to even a more recent but incomplete report, only 75.5 per cent of the population are included in the birth registration area. Until the entire country is included in both birth and death registration returns, no authentic birth- and death-rate for the entire nation can be obtained.

There is as yet no uniformity in the classification of stillbirths, either as to causation or as to time of occurrence; that is, did a stillbirth occur before viability; did it occur before labor; or if during labor, at what stage?

There is furthermore no agreement on the differentiation, in point of month, between abortions and stillbirths. Some use the term "stillbirth" for all fetuses born dead after 4 months of pregnancy. Some use the term only after 7 months. In probably the majority of cases "early abortions" are *not* reported at all.

Another example of such divergence in grouping, is to be found under the heading of "Prematurity." The greatest difference is here to be found in the reports. The weight and length of the fetus should be noted, together with the date of the patient's last period. Important details regarding neonatal deaths, are commonly lacking.

Again, in the grouping, "Puerperal Maternal Deaths" it is found that there is likewise much divergence. As an example, take the cases of pneumonia occurring 10 days to 3 weeks postpartum. Some of these are classified under "Puerperal Infections" and others under "General Medical Diseases."

We see, therefore, at a glance that from the gross statistical stand-

point alone, a great amount of improvement is still needed in order to obtain accurate, positive information and to bring about more satisfactory results in all conditions relating to mothers and their young.

Conclusions to be sound should represent, in last analysis, the opinions of medical experts accustomed to the proper evaluation of results. We can all, however, accept without fear of error this premise, even though some may be skeptical of much of the agitation for better care of the expectant mother, that "parturition is still surrounded with many dangers."

The late L. Emmett Holt graphically portrayed the "homely" side of motherhood when he said that:

"One of the tragedies of life is the fact that so few of those who are called upon to meet the responsibility of motherhood and fatherhood have had anything approaching adequate preparation and training, and that such a small number have had even the opportunity to acquire it. We know in this world only what we have been taught by our own experience or by that of others. No amount of maternal affection and devotion can take the place of knowledge when it comes to being applied to such problems as arise in the bearing of children and in their subsequent care. The lower animals are guided by their instincts to give their offspring the right care, but the human mother has no such guide."

The expectant father has responsibilities in addition to merely providing the necessary funds for the lying-in period. He should endeavor to learn, too, something of the nature of pregnancy and labor and render such assistance and coöperation as will help most in tiding over one of the difficult experiences of life. The wife should be relieved of worry, fear, and nervous strain as far as is possible. Love is doubly appreciated at such times.

It has been shown beyond refutation from various carefully prepared analyses (due allowance having been made for certain inaccuracies and for incompleteness) that both maternal and infant mortality are shockingly high in the United States, even though this is a highly prosperous and, on the whole, a healthy and educated country.

Many factors must be taken into account in order to explain existing conditions. Ignorance, indifference, poverty with its overcrowding in urban communities and industrial centers, paucity of hospital facilities in large sections of the country, lax laws, unsupervised midwives, and imperfectly prepared physicians all go to explain this high mortality-morbidity rate.

"Infant mortality cannot be cut down and kept down unless conditions of living are good: and conditions of living cannot be good unless a given population is much below the saturation point. In general, a high birth-rate means a high death-rate because of inhospitable local conditions at any and all times." [1]

It is apparently true that, despite the general improvement in health conditions in this country—barring influenza epidemics, during the past 10 or 15 years—but little progress has been made either in the reduction in number of deaths from parturition or in the amount of either partial or complete invalidism resulting therefrom. In fact, certain investigators point apparently to an actual increase in the maternal death-rate. The two outstanding causes of this high maternal death-rate are first, and foremost, *sepsis,* and secondly, the *toxemias of pregnancy.* Despite the many efforts that have been made to improve the technic of delivery, sepsis still remains the greatest danger that the parturient has to face.

In England, Sir Arthur Newsholme estimates that puerperal sepsis is responsible for 31.7 per cent of maternal deaths and that the toxemias, with or without convulsions, account for 21.6 per cent.

The figures compiled by the Metropolitan Life Insurance Company show 42 per cent of maternal deaths as due to sepsis in some form and 26 per cent to the toxemias.

In 1921, according to the United States Census the causes of maternal deaths were as follows:

Cause	*Per Cent*
Sepsis	40.3
Albuminuria and eclampsia	26.8
Accidents of pregnancy	8.4
Puerperal hemorrhage	10.2
Other accidents of labor	10.0

In New York State this septic rate is apparently somewhat lower. According to Otto Eichel, from 1915 to 1921, puerperal sepsis caused 27 per cent of the deaths in childbirth. He brought out the fact that there is a regular *seasonal mortality,* the highest point being in March and the lowest in September.

One of the most puzzling features of sepsis connected with childbirth is that it is not infrequently seen in otherwise absolutely normal, or apparently normal, cases who have had no internal examinations

[1] Edward M. East, *Mankind at the Crossroads.*

during labor or directly before labor. Recent intercourse is unquestionably responsible for many of these. Another explanation may be that the intestinal tract is now known not infrequently to harbor the streptococcus hemolyticus. This high septic rate would seem, moreover, at times more likely to be found in hospital deliveries than in home deliveries, even though the former are supposed to have all the advantages of up-to-date aseptic technic.

A study of the report of the Massachusetts Committee on Maternal and Infant Welfare for 1921, shows:

(*a*) 1 dead mother for every 182 births, from causes due to pregnancy and the puerperium

(*b*) 110 deaths, or somewhat over one-fifth of the deaths, as due to sepsis

(*c*) 110 deaths due to toxemias with or without convulsions: *i.e.*, over one-sixth of the total number

(*d*) In addition, 12 deaths from pernicious vomiting and 18 due to nephritis

Prenatal care unfortunately cannot, *per se,* affect the sepsis rate. It will, however, accomplish this indirectly but powerfully through educating parents to demand better care at delivery. The best of prenatal care will fall far short of giving satisfactory results, unless in addition, proper protection is given to both mother and child during labor, whether this be premature or at term.

Twenty to twenty-five thousand women each year are practically certain of losing their lives in this country from causes incident to motherhood, and it would not take great imagination to believe the actual number to be larger than this; yet we are confident that at least one-half of these lives could be saved with reasonable prenatal and intranatal care.

But if the mortality rate alone is discussed, one fails to receive a true picture of actual conditions; for morbidity is of such great importance, that it needs to be kept continually in mind even though no chart can graphically show the extent of such invalidism. Of the two dangers, namely, mortality and morbidity, the latter would seem the more far-reaching in its dire results, because of its widespread distribution and because of the many conditions that are either rendered worse by pregnancy or that actually have their origin in either pregnancy or labor.

The evil effects of parturition upon almost all acute or poorly supervised chronic medical conditions, cannot be overestimated. This is

most marked in the presence of tuberculosis, Graves' disease, renal affection, high blood-pressure, psychoses, and certain heart conditions. Good care, to be sure, will mitigate these evil effects, but the average woman in the country at large so far *has been unable to have good care.*

One of the gravest problems to be faced, sooner or later, is the frequency of conception in its relation to maternal health and the health of the offspring.

"Domestic relations may be ideal, sanitary conditions perfect, and wages at the peak of possibility; but if the mother is to have pregnancy after pregnancy at unthinkably short intervals, she cannot keep her strength, she cannot bear healthy children, or give them the proper care. It is impossible to evade this truth." [2]

Deaths from all causes, including stillbirths, increase according to the number of children borne by a mother.

Gynecological surgery is very largely concerned with obstetric trauma in some form. Tubal infections, in particular, are specially prone to light up anew and spread as a result of abortion or of childbirth. Probably no single factor plays such an insidious part in the invalidism of women during the child-bearing period, as either spontaneous or criminal abortion, particularly the latter. The great majority of women receive little or no supervision at such times and in consequence develop either severe sepsis, or one of milder degree, which, however, results in pelvic congestion with menstrual disturbances, anemia, and general poor health.

Abortions, moreover, are so common, that it is quite useless in the writer's opinion to attempt to make positive statements as to their frequency, and yet thousands and thousands of potential lives are certainly lost in this way. From the standpoint of the economist this may perhaps be an advantage to the nations of the world; but from the standpoint of child conservation it certainly presents an unfortunate and unsatisfactory picture. Furthermore, much of the so-called "one-child sterility" is due to neglect at time of labor or at the time of miscarriage.

Prematurity, together with immaturity, represents the greatest single cause of early infant death. A large number of infants live but a few hours or a few days no matter what we do or how hard we fight to preserve their lives. They simply cannot cope with external conditions. We see, time after time, babies that come into the world after an easy birth, that after a few hours or a few days grad-

[2] East, *Ibid.*

ually grow weaker and weaker, until life is extinct, without our finding it possible, in many cases, to offer an entirely satisfactory reason.

Toxic conditions of the mother during pregnancy represent the next most common cause of early infant death and are often the direct cause of the prematurity. Injuries and accidents during birth come next in the list. Syphilis in neglected, untreated cases probably exacts a considerable toll although this is not as great, in the community at large, as might seem from certain studies of relatively small numbers.

Organized prenatal care so far has made no deep impression on the number of abortions and premature infants, despite the fact that together they form such a serious loss of child life.

The outstanding reasons for this are:

1. The patients are not seen early enough in the pregnancy by either physician or nurse, *and then are not seen often enough.* The earlier prenatal care starts, the better will be the results

2. The situation in the home is usually beyond our control so that much may go on which we are, despite our effort, quite incapable of preventing

Of every hundred babies that died (according to the United States Census of 1921) before their first birthday, 46.8 or almost one-half, died because they were either born prematurely, were malformed or injured at birth, or were born inadequately equipped to adjust themselves to the demands that life put upon them. Moreover, these died mostly in the first weeks of life. This illustrates very clearly the fact that a large part of our infant mortality goes back to the conditions that affect the unborn infant and the infant in the first days of life. This may be more graphically shown by the computations of Philip S. Platt in his study of the Census of 1922. This shows that of every hundred infants dying under one year of age:

Deaths, per cent	*Age at Death*	*Deaths, per cent*	*Age at Death*
19.2	under 1 day	52.6	under 1 month
18.7	1-6 days	47.4	1-11 months
14.7	1-3 weeks		
8.3	1 month	100.0	under 1 year
6.5	2 months		
14.4	3-5 months		
10.3	6-8 months		
7.9	11 months		

Again, almost identical results are obtained from a study of Eichel's figures for 1921 in the state of New York (outside of New York City). That year there were 8,464 children who died in the state, with 4,681, or over one-half that did not live through the first month of life. In fact, of all the children, 2,008, or 24 per cent, did not live through the first day of life and 4,124, or about one-half, did not finish their first two weeks of life.

This makes it clear that the dangers to the newly born child are greatest immediately after birth, its security from sickness and death becoming greater with each day it lives. Therefore, efforts to prevent this loss of child life to be highly effective, should commence with the mothers before the children are born and painstaking care must be given the newborn child during the first days and weeks of life.

It is quite reasonable, I think, to conclude from these illustrations that of all the deaths caused during the first year, poor heredity together with one of several prenatal factors play the most important part. Approximately 75 per cent of all deaths during the first month of life are due either to these congenital conditions or to injuries at birth or to changes occurring soon after birth. Deaths from antenatal conditions are dependent in a large measure upon the care and supervision given to the expectant mother during pregnancy. Such care cannot unfortunately remedy many of the truly inherent defects of the original germ-plasm nor can it lessen the percentage of so-called "fetal anomalies." Intrapartum deaths and deaths occurring soon after birth are the result of injury during the birth—such injury, excepting in premature or immature infants or in babies with a hemorrhagic tendency, depending in about 50 per cent of the cases upon poor obstetrical management.

Intracephalic lesions may be considered to exist in about 40 per cent of infants dying during labor or of those dying in the early postnatal period. Lesions of the cord, fracture or dislocation of one of the cervical vertebræ, are not uncommon in breech deliveries.

In as much as many children with lesser grades of injury continue to live with a varying degree of handicap, one may safely conclude that such cephalic injuries are far from uncommon.

The causes of stillbirths at the time of labor are varied and are to a large extent dependent upon the same factors that bring about neonatal deaths during the first month of life. Real progress in the determination of such causation can be brought about only by means of the most painstaking and prolonged clinical observation, together

with the most careful autopsy investigation. In many of these, no one, unless particularly experienced in infant autopsy work, will be able to describe accurately the actual cause of death. Up to the present time, much of our knowledge regarding so-called stillbirths is inaccurate and incomplete largely because of the incompleteness of stillbirth certificates, or a failure to obtain sufficient autopsy findings.

One of the most interesting and valuable reports on the study of the causation of fetal death was brought out by Eardley Holland in 1922 under the auspices of the Local Government Board of London.

"An examination into the causes of fetal death is bound to add to our knowledge of conditions likely to prove injurious or fatal, and greater knowledge provides us with more effective weapons for preventing death and injury."

Holland also suggests that in order to obtain more accurate data a change be made in the terminology of so-called stillbirth. The changes he proposes offer so many advantages that already in this country certain physicians are proposing to adopt his suggestions. He proposes, and in this we agree, to give up the use of the word stillbirth, and in its place use the word fetal death. Such fetal death may occur at three periods:

1. Antenatal, when the fetus is in a measure macerated, or is dead, at least, at the onset of labor (to be referred to later)
2. Intranatal, *i.e.*, during labor
3. Postnatal, when the fetus is born with its heart beating, but with pulmonary respiration never established

The actual cause of death is undoubtedly often difficult to determine as there is usually more than one direct cause, but in all classifications, a sifting process of the *essentially primary cause* must be made. The fundamental primary causes for such fetal deaths are:

(*a*) Maternal conditions such as syphilis, toxemia, placental hemorrhages

(*b*) Injuries or accidents during labor

(*c*) Fetal conditions, such as prematurity, immaturity, and deformities

From the study of Holland's stillbirth or "fetal-death" records it would seem justifiable to conclude that over 50 per cent of the deaths are due to preventable causes about equally divided between faulty prenatal treatment and faulty technic at delivery.

"The two chief means of prevention of stillbirths or fetal deaths

suggested by this study are first, better prenatal care, and second, an improved standard of midwifery practice to be obtained through the better education of the medical student as well as of the midwife and maternity nurse. Prenatal hygiene is being slowly but surely developed, partly through prenatal centers and local authorities, at which the expectant mother can obtain advice, and partly through prenatal clinics in connection with hospitals; partly through the increased interest on the part of midwives and medical practitioners. Antenatal examination treatment would undoubtedly save a large number of stillbirths.

"The present report clearly illustrates the importance of skilled supervision during pregnancy for the benefit of the child no less than the mother. Such supervision can only become effective when the mothers themselves appreciate the necessity of it and are prepared to make use of the facilities provided them."

From what has been presented so far it is fair, I think, to admit that prenatal care is urgently needed and is, in fact, the *right of motherhood*. Any public movement or private effort that will clearly overcome, in a measure at least, some of the evil effects of parturition and that will bring more and better babies into the world—any such effort, I say—is well worth a trial.

To refuse such a trial because of bigotry, or indifference, or opposition to state or national assistance, is little short of criminal.

Prenatal care has shown its most brilliant results so far in regard to maternal mortality up to the time of labor, in the toxemias, and chiefly the toxemias with convulsions, of pregnancy.

By way of illustration we may refer to the results in a few clinics in New York City. In 1922, 1923, and 1924, the Berwind Maternity Clinic, under th emanagement of Bailey, had 4,488 deliveries; 55 of these patients were pre-eclamptics and 5 were eclamptics, 2 antepartum and 3 postpartum. In this series there were *no* eclamptic deaths. The total maternal deaths were 14 (*i.e.*, 1 in 320) with a net figure of 6 (*i.e.*, 1 in 748).

The total infant death-rate up to 4 weeks of postpartum life was 5.2 per cent.

Again, according to Frederick W. Rice, there were during the past 7 years, ending 1925, 92 cases of eclampsia in 16,600 admissions to Bellevue Hospital and the School of Midwifery. Of the 16,600 admissions, only 11,500 were registered, previous to admissions, for prenatal care. There were 4 cases of eclampsia developing among the patients

receiving this prenatal care. All the cases of eclampsia went to the end of pregnancy, 2 developed during labor and 2 during puerperium, with no fetal or maternal mortality.

Another illustration of what can be accomplished in a mixed community by careful organization work is seen in a recent report of the Maternity Center Association of New York.

The cases are carefully followed at regular intervals from the time they first report to the clinics. They are delivered by private physicians, by private midwives, and by the indoor and outdoor departments of hospitals. In this group are also included certain cases cared for by the midwives of the Bellevue School of Midwifery. In this report there were 1,999 so-called closed cases, *i.e.*, cases in which the records are complete throughout pregnancy, labor, and the puerperium. Of this group:

189 cases were delivered by private midwives

371 cases were delivered by private physicians

924 cases were delivered by hospitals (indoors)

8 cases were either miscarriages or precipitate deliveries before the attendant could reach the home

507 cases were home deliveries attended by hospital assistants; and of these:

329 were physicians' cases

187 were cases of midwives of the Bellevue School of Midwifery

In this number there were 5 dead mothers, or a death-rate of 0.2 per cent. One mother died of sepsis, 2 of pulmonary embolism, one from postpartum hemorrhage associated with multiple myomata, and one from hemorrhage in a toxic case from a premature separation of the placenta. This latter case had only been cared for during the last 12 days of her pregnancy, and therefore, in reality, should not be counted in under the results of prenatal study. The most striking feature of this group lies in the fact that there were *no* deaths from any form of toxemia of pregnancy.

There were 62 infant deaths or a death-rate of .031 but of this number 20 were so premature as not to really be viable. Disregarding these premature infants, the mortality rate would drop to .021. There were 42 stillbirths which would give a rate of .021 but of these, 11 were markedly premature. If the latter are disregarded, the rate drops to .01.

Our conclusion briefly from this survey is a very definite one:

namely, that by means of thorough coöperation between the hospitals, private physicians, midwives, and maternity centers, very marked improvement may be obtained. The results can never quite equal the results shown by certain thoroughly organized hospitals because of the fact that in the case of the latter, it is easier to have continuous supervision throughout the entire period of parturition. Other communities will do well to study such an example as this one for they, too, may have similar results providing the same zeal and coöperation are used and providing, too, that sufficient moneys are obtained for carrying on careful, constructive work.

Prenatal care has likewise clearly demonstrated that, by taking all cases of bleeding during pregnancy seriously and by giving prompt attention thereto, most cases of deaths from hemorrhage, whether from so-called accidental hemorrhage or from placenta previa, can be avoided.

With the community demanding thorough prenatal education and better care at delivery, the needless sacrifice of life from sepsis can be at least partially wiped out, so that the present gross maternal mortality may well be cut in two.

By the early recognition of syphilis and treatment thereof, as will be shown in a later chapter, very great improvement can be made in those cases suffering from syphilis.

The earlier the prenatal care and the more carefully it is administered, the fewer will be the number of cases of abortion and premature labor. With better prenatal care, together with better care during delivery, the number of stillbirths and neomatal deaths can be reduced from 40 to 50 per cent.

Two examples in public health effort of organized prenatal care may be cited to illustrate the possibilities that lie within the reach of all who seriously approach this subject. First is the so-called "Thetford Mines Experiment." The high rate of infant mortality in French Canada caused the Metropolitan Life Insurance Company to undertake, in 1921, a demonstration in child welfare intended to prove that this waste of child life was needless. After a careful survey the town of Thetford Mines, an asbestos mining center in the Province of Quebec was selected as the seat of the experiment. A French-speaking nurse with extensive experience in maternity center work was placed in charge and assigned a staff of two other French-Canadian nurses and, later, of a physician, all of whom were given special training in New York City. As a result of the three-year experiment,

the infant death-rate in Thetford Mines has been reduced from 338 per thousand to 96.4 per thousand.

Another gratifying outcome of the experiment has been that because of the results obtained in Thetford Mines, the Provincial Government of Quebec has appropriated five hundred thousand dollars

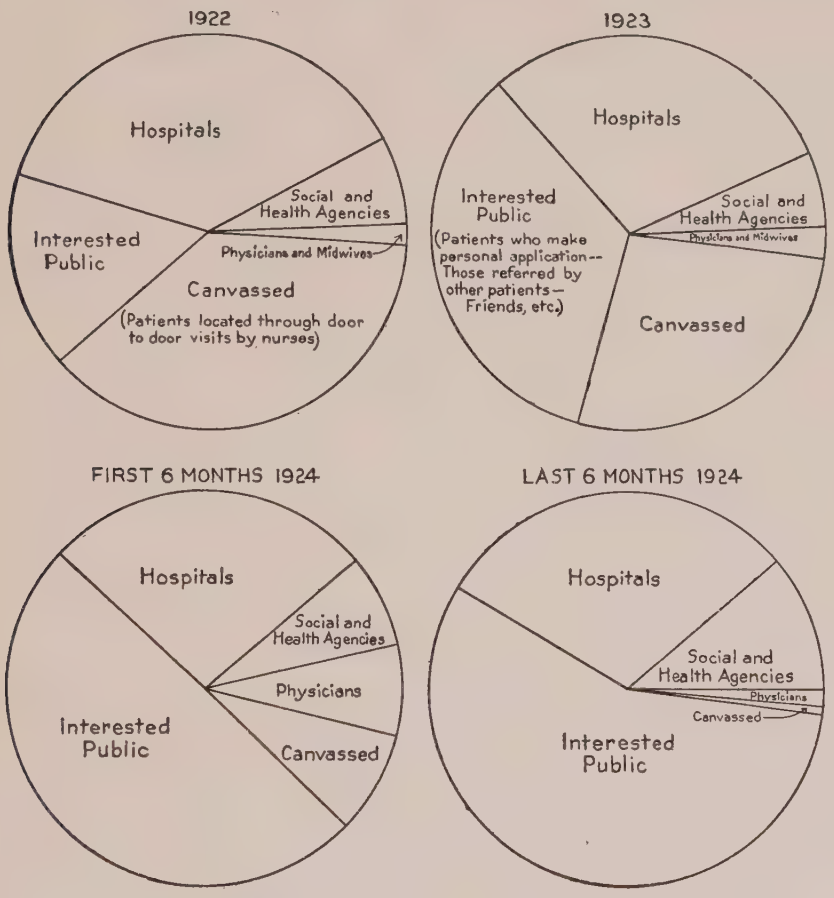


FIG. 1.—SOURCE OF PATIENTS CARED FOR BY MATERNITY CENTER ASSOCIATION.

to be used during the next five years in child welfare work in the Province.

The first illustration shows certain interesting facts in connection with the community work of the Maternity Center Association of New York.

By the graphs two highly interesting facts are made apparent: (1) the high rate of canvassing for patients in 1922 as compared

with the almost imperceptible rate in 1924, and (2), as a corollary to (1), the great increase in the public interest and in the visits to the clinics. These results represent tact, patience, and perseverance on the part of the nurses and an enormous economic saving, and may be used as a demonstration of what any community can do to a greater or less degree providing it has the opportunity, the vision, and the will.

"It is self-evident that no amount of prenatal or intranatal care will effect all conditions classified under the heading Congenital Diseases. No amount of instruction in follow-up work will control congenital defects of the heart, brain, diaphragm, spine, biliary passages, etc., and no amount of control work will eliminate all deaths due to prematurity and congenital defects.

"It is contended, however, that the greater number of deaths strictly due to congenital causes may be prevented" (Sobel).

BIBLIOGRAPHY

Am. J. Pub. Health, Feb., 1925.

Holland. Report on the Causation of Fœtal Death, Ministry of Health, London, 1922.

New York State Health Department Bulletin, Albany, 1922.

Platt. American Child Health Journal, Jan., 1924.

Sobel. New York City Department of Health Bulletin, 1918.

Van Ingen. Mother and Child, July, 1922.

CHAPTER II

THE ESSENTIALS OF PRENATAL CARE

Prenatal care affects both mother and child. Its methods are fundamentally "preventive" in nature, and the degree of success depends almost mathematically upon the zeal, patience and skill employed during both pregnancy and labor.

The general purposes of complete maternity care are:

(*a*) The education of both parents in the important aspects of pregnancy and in the need for careful, skilled care at delivery

(*b*) An early thorough examination of the patient, with return visits at stated intervals

(*c*) Detection of any medical condition, liable to be aggravated by the pregnancy

(*d*) Detection of pelvic abnormality

(*e*) The early diagnosis of an existing gonorrhea or syphilis

(*f*) The prevention of abortion and of premature labor.

(*g*) The early recognition of the importance of hemorrhage or even slight staining together with the necessary treatment

(*h*) The early recognition and treatment of the toxemias of pregnancy

(*i*) A safe delivery at or near term

Our goal should be to carry every expectant mother to full motherhood with health unimpaired or actually improved, and with a nervous system well poised to cope with the many new problems of life; furthermore the conservation of child life by such "preventive care" of the mother and the early institution of judicious treatment as soon as unsatisfactory symptoms arise. Specifically this is accomplished:

(*a*) By the early treatment of all cases of threatened abortion or premature labor

(*b*) By the early and continued treatment of syphilis, both during pregnancy and during the early months after birth

(*c*) By the treatment of gonorrhea to protect the baby's eyes from ophthalmia and possible blindness

(*d*) Through the avoidance of the severe cases of toxemia or of hemorrhage, by means of painstaking care of the mother

(*e*) Through improved obstetrical technic at delivery, whether this be at term or not

In as much as this is not a textbook upon obstetrics, but a monograph merely, of suggestions, primarily intended for the guidance of the general practitioner, the writer can do no more than stress the outstanding features arising in the course of obstetric practice, with the hope of encouraging greater interest in maternal welfare and child conservation.

It should be the effort of the physician or public health nurse to have the expectant mother apply for examination and advice as early as possible in the pregnancy. This suggestion is not due to overcautiousness, but to the definite belief and experience of a large group of obstetricians that early and constant supervision of each and every expectant mother is the only method by which the average woman can go through this experience with anything like a fair degree of safety. The writer is quite aware of the fact that thousands of women pass through pregnancy safely without care of any kind; and yet again, he is constantly learning of the *terrible experiences* of others. Because ninety-nine escape with their lives, there is no reason for neglecting the one.

Physicians should remember too, when doubtful of this need, that it is not *mortality alone* that is to be feared, but *morbidity as well;* and that not only should they concern themselves with the state of health of the patient during the comparatively short period of the pregnancy, but they should keep in mind likewise, the possible years of invalidism which may be the result of either carelessness or ignorance.

It is the duty, then, of the physician who has his patient's best interests at heart, to take childbearing more seriously than he has heretofore, and not to trust, too much, to "all-wise Providence."

The patient should see her physician once in 3 weeks for the first 5 months; every 2 weeks until the end of the seventh month; every 10 days through the eighth month, and once a week through the ninth month (*ideal*).

If this scheme is impossible, and obviously it is bound to be impossible for many, then the physician should endeavor to have either

his nurse or a public health nurse see the patient *in his place* and *under his direction* at definite intervals. Until some plan of this character can be carried out more generally, there can be no great lessening in the percentage of abortions, in the number of premature labors, or in the other numerous complications that arise as result of some pathology of pregnancy, or as the result of either ignorance or indifference.

When examining a patient, particularly for the first time, if any departure from the normal is discovered or if a condition is found to exist that may be aggravated by pregnancy, great care should be used in what is told the patient, and in the advice given her. The physician should always strive to eliminate fear from the patient's mind. The majority of women, if the truth be told, have a very natural dread of their first confinement. In some, this fear continues with subsequent pregnancies.

EXAMINATION OF THE PATIENT

History.—A thorough history should be taken in each case at the time of the patient's first visit. At this visit essential facts relating to the present pregnancy should be brought out. No time need be consumed in nonessentials. From a medical standpoint it is highly important to determine whether or not there is any history of scarlet fever, diphtheria, severe influenza, and particularly any history of either an active or a chronic kidney condition, of tuberculosis or heart disease; from the obstetrical standpoint if there has been any previous pregnancy or labor. Essential facts should be determined and noted. Difficult labor, habitual oversize of the child, any tendency to hemorrhage are all important. If there has been a stillbirth the time of occurrence of this accident should be obtained if possible. One or more abortions are certainly worthy of note.

Medical Examination.—This should be complete in every *essential* detail. All irregular or abnormal symptoms need careful interpretation and these should be recorded. The patient's general appearance is of consequence. Many errors in judgment are made in the presence of any departure from the normal in pregnancy.

While it is true that pregnancy not infrequently undermines the health of the patient in robust health, yet we all see from time to time just the reverse; namely, a pale, frail girl who becomes pregnant and who after four or five months of pregnancy blossoms forth into

perfect health. In many cases, on the other hand, of tuberculosis; in certain cases of active Graves' disease; in certain few cases of kidney complication with early high blood-pressure, as well as in certain psychoses, the continuance of pregnancy may be fraught with very real danger. In suspicious cases an early consultation with an internist is highly desirable.

No decision to interrupt pregnancy on any grounds either medical or surgical should be made without adequate consultation. Moreover it is important to remember that either an artificial abortion or an early induction of labor is often a difficult operation and should not be undertaken lightly. The ethical aspect must never be lost sight of.

The blood-pressure should be taken at this first visit as well as at all subsequent ones. It is of great value throughout pregnancy and if carefully taken will often ward off serious danger. This will be referred to again later on.

A careful urine analysis should be made.

Pelvic Examination.—Such examination should be carried out on a table and with great gentleness so as neither to alarm the patient nor cause her undue pain.

This examination concerns itself (1) with the size of the bony framework and the rigidity of the muscles, (2) with the position of the uterus, particularly in the early months, and (3) with the presence or absence of pelvic tumor.

In the examination of the pelvis and its contents, it is well to remember that there is no room for dogmatism in the consideration and interpretation of pelvic measurements, and the possibility of an abnormal labor. While we believe it advisable to take careful external and internal measurements for the sake of thoroughness as well as for the possibility of discovering marked bony abnormalities, still to dogmatize early in pregnancy, regarding the final outcome, in borderline cases at least, is foolhardy.

The greater the experience of the obstetrician, the more conservative he is likely to be, and the less likely he is to positively prognosticate early in pregnancy, regarding the method of delivery or to rush into severe operative interruption at the time of labor or before labor, excepting in marked grades of pelvic or other abnormality. Moreover, in all borderline cases, unless there is some obvious reason to the contrary, a reasonable test of labor under the strictest asepsis can and should be made.

There is not only a passage to consider, but a passenger as well.

To consider the one and not the other is far from the point; the one is quite as important as the other. No one can foretell accurately until near the end of pregnancy, the probable size of the fetus at term; nor does the size of either mother or father necessarily bear a direct relationship to the size of the offspring, although at times there does seem to exist a relationship between a big child and a father above the average.

Many unnecessary cesarean sections, unnecessary inductions of labor, unnecessary versions and forceps operations have been resorted to, and are still being resorted to to-day, simply because sufficient conservatism has been lacking. Every one of real experience has seen cases that seemed almost surely to demand cesarean section, that have yet delivered themselves unexpectedly and without too great effort, *when given a reasonable chance.* Therefore, I say, do not be too positive until towards the end of pregnancy or until a test of labor has been given, that the delivery *per vias naturales* is not possible. On the other hand, it stands to reason that in certain cases with obvious, extreme dystocia, one is justified in concluding, and even in telling the patient, at an early date, that an operative delivery may be necessary.

The *slender type* of woman *in general* is more easily handled in labor and is less prone to severe difficulty. The muscles offer, on the whole, less actual resistance than in the *thickset type* and the bones themselves are more often than not, less thick in the former than in the latter.

At the time of this first pelvic examination, providing it is made during the first three months, the position of the uterus, is of definite importance.

Retrodisplacement.—Retrodisplacements are very common, so common in fact at all ages, that unquestionably undue importance has been placed upon the condition by the gynecologist.

In pregnancy two courses are open after the diagnosis of retrodisplacement is made: the ultraconservative course or the forcible method.

1. *Ultraconservatism.*—Entire reliance is placed upon *nature's* ability with "help" to gradually bring the growing uterus up into place. Nature is helped by either the knee-chest position twice daily for 10 to 15 minutes *or* the "bear walk" on all fours, once or twice a day (Fig. 2).

In cases of retrodisplacements that are uncomplicated by either a

previous peritonitis or an existing tubal or ovarian condition, this method will prove almost uniformly successful.

It will be found that within a very few weeks or at most by the end of 3 to 3½ lunar months, the uterus will be up in normal position.

During the early part of this period, intercourse is contraindicated

Fig. 2.—The So-called Bear Walk or Monkey Trot.
This position is of great value in the prevention of and correction of uterine misplacements.

as it tends to cause abortion and at the same time often renders the retroversion worse.

2. *Methods of Force.*—The usual method is to attempt forcible reposition of the uterus either with or without an anesthetic. If the uterus can be restored to its position, a pessary is introduced and left in if comfortable until the completion of about 3½ months. It is then removed because the uterus is large enough to retain its good position and the ring can do no further good. In case there is failure at reposition, not infrequently an operation is suggested.

The writer wishes to warn against the common practice of radicalism in the handling of these cases. Many times patients are told

that they have an adherent uterus when in third degree retroversion, when they really have not. If a patient has never had salpingitis or any form of local peritonitis, it is a fairly safe conclusion that the uterus is not adherent and, therefore, the great majority of cases as mentioned above can be safely handled with conservative measures. This does not mean that occasionally an operation may not be required.

Urine Analyses.—The routine examination of the urine offers a relatively safe guide in our estimation of the condition of the kidneys and liver. A carefully regulated diet; scrupulous care of the intestinal tract together with a reasonable amount of rest, will insure the average patient a safe pregnancy.

Specimens should be examined every two weeks until the end of the fifth month; then every ten days until approximately the end of the eighth month, and, finally, every week. In the presence of abnormal symptoms, pointing to deranged liver or kidney function, or marked intestinal putrefaction, specimens should naturally be examined more frequently. This seems elementary for a monograph written for physicians and yet, as I have said above, it seems necessary to lay stress upon the elementary essentials, because of the widespread disregard of fundamentals.

Although such frequent examinations are advisable, it has been proved, I think, from many studies on large groups of women during pregnancy, that elaborate tests under ordinary circumstances are not necessary. The simpler analyses, if carefully and frequently carried out, are in at least 90 per cent of the cases, safe. The really important tests are:

1. Degree of acidity
2. Specific gravity
3. Presence or absence of albumin (most important)
4. Indican
5. Microscopic analysis
6. Total 24-hour amount (when suspicious)
7. Presence of sugar (This is of secondary importance.)

Under the fifth heading especial attention should be paid to the presence or absence of casts, to the presence or absence of large numbers of bacteria, and to the percentage of pus cells.

The specimens in any doubtful case should be from a 24-hour specimen and should always be as fresh as possible, and should be examined most minutely after filtration. Old specimens are of no value. To preserve the specimen, a few boracic acid crystals, a few drops of

chloroform, or a few drops of formalin will prove satisfactory. The vulva should be carefully cleansed before voiding, and the bottle or vessel used, should be scalded. The writer has shown over a period of a considerable number of years—and has also repeatedly seen the same thing demonstrated in public health efforts—that, with this scheme in mind, together with a careful blood-pressure reading, the patients can be usually kept within the safety zone.

Blood-Pressure.—Blood-pressure readings are of very great value. In many instances, the first danger signal appears in such change, rather than in the gross urinary findings. As pregnancy progresses, a sudden, sharp rise in blood-pressure (the patient being at rest) even without the peak being above 150 mm. Hg. is suggestive; or a steady, gradual rise, week by week, to from 150 to 160 mm. Hg., needs close watching.

A certain percentage of expectant mothers show a very high index, even early in pregnancy, as a result of some form of subacute or chronic toxemia *not* due to pregnancy. (In this group there often exists a latent chronic nephritis.)

These cases, in the writer's judgment, need very special care and if permitted to go on in pregnancy, require nitrogen partition examination, etc., rigid rest, rigid diet, and repeated study of the eye-ground. Such patients usually have a long period of invalidism; often "abruptio placentæ," and all too frequently a "puny," or dead baby. Not uncommonly *bad teeth or bad tonsils* are the etiological factors in the high blood-pressure, and treatment during pregnancy may change the picture entirely.

It is probably true that careful blood chemistry will help us to detect at a very early date all cases with faulty elimination and yet the number of cases that are able to have careful (and sane) blood chemistry interpretations are, after all, very limited.

DIET

The diet of the average patient during pregnancy can, in general, follow the list of instructions outlined below:

BREAKFAST

CEREAL.—Oatmeal or other coarse cereals are the best because they help to prevent constipation. All cooked cereals should be *thoroughly cooked.*

Milk.—Use milk or cream on cereals and but little sugar. Cocoa and milk are preferable to tea or coffee. Tea and coffee have little or no food value, and often take the place of necessary foods.

Bread.—Any kind of bread may be eaten with butter, but whole wheat bread, graham, rye, or bran bread are better than white bread, and should not be fresh.

Fruit.—Fresh fruit or stewed fruit should be eaten daily.

Eggs.—If any additional food is required, an egg, with or without bacon may be served.

DINNER

Soup.—Almost any type of soup is satisfactory with the exception of beef extracts. Vegetable purées are particularly wholesome and nutritious.

Meat.—*Small portions* of meat once a day, or at most twice, will be sufficient. In place of meat use fish, cheese, eggs. Chicken is generally accepted to be less harmful than beef, although theoretically perhaps it is not!

Vegetables.—Eat at least two vegetables each day.

Bread and Butter.

Dessert.—Fruits or simple puddings made with milk, eggs, rice, tapioca, cornstarch, or gelatin, are best; ice cream my be taken in moderation.

SUPPER

(Or lunch, if dinner is taken at night)

Something Hot.—Such as a cream soup flavored with vegetable; or macaroni or rice with tomato; or a vegetable with cream sauce; or eggs in some palatable form.

Bread and Butter.

Light Salad.

Light Dessert.—Such as fresh or canned fruit.

Eat regularly at the same time each day.

Eat slowly, chew food well.

Eat a light supper at night, if possible.

Drink from 6 to 8 glasses of water during the day.

Milk is invaluable for those who can readily digest it, both for its direct nutritive properties, as well as for its *calcium content.*

Regular calcium medication should be given without fail where there is a history of hemophilia in a family or where the children are regularly premature.

The writer feels that the patient's appetite must be satisfied, but this should be accomplished with as little tax on the digestive and excretory systems as possible.

Many patients need a little refreshment between the three regular meals of the day. This will prevent some of the nausea and a great deal of the "faint feeling" that comes with an empty stomach.

Overindulgence in food is naturally *not* wise, for it will tend to upset the digestion as well as to put on too much weight.

Special caution is advised regarding:

(*a*) Strawberries and canned tomatoes
(*b*) Beef
(*c*) Candy, particularly chocolate
(*d*) Crabs
(*e*) Lobsters

Of these the patient should eat either "not at all" or most sparingly.

Absolute self-denial in the use of *alcohol* is urged. Nothing but harm will result from the neglect of this advice. *Smoking* in very great moderation will do no harm but overindulgence is extremely bad for the mother and often exerts a pernicious influence on the child.

Rest.—Rest and freedom from worry are of the greatest importance both to the expectant mother's immediate comfort as well as to her future health and the well-being of her child. *This does not mean laziness or inactivity,* but it does mean some rest each day if possible, a full night's sleep with plenty of fresh air, complete cessation from all hard labor whether manual or industrial, at least 4 weeks before the expected labor. In the case of those engaged in factories requiring physical strain, resumption of work should not occur, if possible, for 6 weeks after the birth of a child.

A constant round of social activities is equally bad. Why expect normal children—normal particularly as to their nervous systems—to be brought into the world, when the mother's nervous system is perpetually under severe tension? It can't be done!

Exercise.—For those who are otherwise inactive, walking in the open air is the best form of exercise.

For those who work in factories and are on their feet most of the day, or for those who have active household duties to perform, active additional exercise is hard to obtain and often unwise.

Horseback riding, driving, motoring on rough roads, and running a foot-power sewing machine, are particularly bad. Golf played

with moderation, for those who have the leisure, may be safe. Tennis is not advisable.

Intestinal Tract.—One of the great lessons to bear in mind is, that the expectant mother should at all times have free elimination, and that both the toxemias of pregnancy, as well as pyelitis have, for practical purposes, their inciting origin in constipation and intestinal putrefaction. The bowels should move daily and move well. Laxatives, although theoretically objectionable, are usually necessary. When these fail and diet fails, then soapsud enemas are advisable. Often small doses of thyroid extract will help to remedy the difficulty in those cases that do not respond to fluids and the "coarse food" diet.

MEDICAL COMPLICATIONS

The following are the most important medical conditions associated with pregnancy:

1. Early vomiting of pregnancy
2. Tuberculosis
3. Heart conditions
4. Pyelitis
5. Toxemias of pregnancy
6. Nervous complications

Early Nausea and Vomiting of Pregnancy.—A large majority of women suffer with this condition in a greater or less degree. Innumerable remedies have been suggested. The reason for this is chiefly because the condition varies with every case and what will help one will often not help another. In general it may be said that the vomiting of a case of average severity depends upon one or more of several factors: (*a*) reflex irritability from the early stretching of the uterus, (*b*) faulty position of the uterus, (*c*) psychological reasons, and (*d*) true toxemia.

The simple cases can usually be helped by eating frequently in small amounts; by not rising in the morning on an empty stomach; by the use of laxatives and by such simple remedies as bicarbonate of soda, milk of magnesia, cerium oxalate or a simple mixture of cerium oxalate, bismuth and ginger. Ginger ale in small amounts is most helpful. In cases of persistent vomiting the writer makes free use of hypodermics of both thyroprotein and lutein. These are given daily, using the preparations alternately for at least two weeks. In addition colon irrigations with bicarbonate of soda solution (one teaspoonful

to the quart) are freely used. Hot flaxseed poultices over the stomach are of great comfort.

Where the patient seems markedly toxic, mouth feeding will have to be temporarily discontinued and the patient fed largely by an enema every 4 hours of approximately 6 ounces of peptonized milk and 2 ounces of 20 per cent glucose solution.

The consensus of opinion seems to be that we have found a most valuable mode of treatment by giving such patients from 750 to 1000 cubic centimeters of 10 per cent glucose solution intravenously. This is done very slowly taking at least one hour or more. This solution must be sterilized carefully and thoroughly mixed. It should be given just *above* body temperature.

On the other hand, if further help is needed, from two to three injections of insulin are given on the same day of the infusion. It seems likely at the present time that this treatment will prove a salvation for many and that fewer and fewer cases will warrant interruption of pregnancy for this cause. The mistake must not be made to feed any of these patients too rapidly as improvement takes place. A carbohydrate diet in general is considered the best, for the time. Although such diet may be the best, scientifically, it will not always agree with the patient as well as some other articles she may particularly fancy.

NOTE.—The glucose solution requires careful filtering. It should be prepared with distilled water and sterilized in an autoclave at from 10 to 20 pounds pressure (preferably the former).

The insulin is usually given in 10-unit doses. Should any symptoms arise from the administration of the insulin, one should give 5 drops of adrenalin chlorid.

Tuberculosis Associated with Pregnancy.—The average case of tuberculosis in itself affects but little the course of pregnancy; it rarely predisposes to either abortion or premature labor or even to stillbirth. The disease is seldom congenital although a small number of authentic cases have been reported in which, in addition to a tuberculous placenta, tubercle bacilli were found in the cord blood, together with tuberculous lesions in the child.

Tuberculous women in general have poorly nourished children which demand an unusual degree of care if they are to survive and develop into healthy adolescence. On the other hand, one occasionally sees an example of an apparently large, robust looking child born of a badly diseased mother. In the presence of an active tuber-

culosis, at any stage in the disease, the child directly after birth should be isolated from the mother and should not be permitted to nurse, both for its own sake as well as for that of the mother. Wet nursing, however, is distinctly valuable.

The weight of medical opinion seems to favor the viewpoint that the effect of pregnancy upon tuberculosis is on the whole a deleterious one. From a study of my own records, as well as from the literature, it would seem safe to conclude that at least 25 per cent of the mild cases, and from 75 to 80 per cent of more advanced cases, become distinctly worse during pregnancy, or in the early weeks postpartum.

It must be admitted, however, that a small group of observers such as Pinard, Petruschky, and others, deny the value of these conclusions and do not think, in the absence of other complications of pregnancy, that the tuberculosis is necessarily aggravated. It is true, unquestionably, that a small number of tuberculous women put on weight during pregnancy and develop a more wholesome appearance, but these symptoms are, generally speaking, fallacious and are merely due to the naturally increased metabolism of pregnancy.

Almost invariably by the end of the pregnancy, or soon after labor, all the bloom will disappear and the patient will admittedly not be so well.

Such differences of opinion must depend, in part, upon differences of individual race stocks, upon different living conditions, and upon different climatic surroundings.

For the purpose of simplicity in classification we may divide all cases into (1) the so-called *fibroid phthisis,* or thoroughly healed lesions; (2) those cases in which the lesion or the lesions have been but recently cured; and (3) the active cases, which again may be divided into: (*a*) the mild group and (*b*) the severe group.

The fibroid or healed cases demand little or no attention beyond careful hygiene.

The recently healed cases require close watching if the pregnancy is allowed to proceed, and will all too frequently either during the pregnancy or the puerperium, suddenly light up anew.

The active cases require the closest sort of care, for *aggravation* is almost inevitably bound to occur. The most severe type of involvement is generally admitted to be tuberculosis of the larynx.

Treatment.—Treatment will depend upon the type of involvement as well as upon the particular stage of pregnancy.

The important question for the physician to decide when the diagnosis of tuberculosis has been made and the patient is found to be pregnant is, "Shall pregnancy be allowed to continue?" Patients falling in group one, that is with one or more old, healed lesions, with no active symptoms at all, should be allowed to continue with the pregnancy.

Those falling in the second group—that is, those in whom the process has been *but recently healed*—if seen early in the pregnancy, should in general have the pregnancy terminated at once, for these are the only cases which will stand a chance of continued good health.

If this warning is not heeded, the great majority of cases with a recently healed lesion who become pregnant will show marked deterioration if the pregnancy is not stopped.

If seen for the first time after the third or fourth month, the course of procedure is *debatable* but, on the whole, it would seem wise to allow the pregnancy to continue, owing to the difficulty of interrupting pregnancy at a later stage, and the probable reaction on the patient's general health.

All active cases—those of the third group—when seen early, should be terminated in the easiest possible fashion. After the first three or four months of gestation we again feel that the pregnancy should continue unless the "downhill" course is too rapid. In those cases of great severity associated with pregnancy which are failing rapidly, even the interruption of pregnancy may be of little or no value; in fact, in certain cases, the mere termination of pregnancy may hasten an otherwise early death.

Cases of laryngeal tuberculosis, it would seem to me, should be terminated at once no matter what the stage be in the pregnancy, unless a delay of a very few weeks might possibly warrant the likelihood of a live child.

In all cases it is essential to remember that if the pregnancy is allowed to continue, the patient must be given every medical and hygienic advantage. This means wholesome food, fresh air continuously, and absolute rest. Here, milk is of very great value. This same advice holds true for all cases who have recently had a child or an abortion performed. Months of careful treatment will be necessary in order to give a reasonably hopeful prognosis. Cases of laryngeal tuberculosis at all times require local treatment from a throat specialist, where such treatment is possible. The writer wishes to reiterate what he has said regarding the need for the advice of an

experienced "internist," as well as to reëmphasize the ethics and risks of the interruption of pregnancy.

Obstetrical Treatment at the Time of Labor.—This should be made as easy as possible and as little anesthesia as is feasible should be used. Gas-oxygen or ethylene are, perhaps, the least injurious for general anesthesia and many will be helped by the use of scopolamin and morphin in small doses. In certain of the more severe cases a cesarean section in the hands of an expert with, possibly, local anesthesia, will offer the best hope to mother and child. Ether seminarcosis per rectum is most serviceable.

In case a cesarean section is done, the question of sterilization must always be considered, but is not permissible as a routine. In the first eight to ten weeks of pregnancy, if an artificial abortion is performed, unless the cervix is soft and short, the best plan will be to pack the cervical canal and vagina firmly with either iodoform 5 per cent gauze, or bismuth gauze, for 24 hours or 36 hours, and then to empty the uterus with either the gloved finger, or dull curet, or a sponge holder.

In certain of the cases in which the emptying of the uterus early in pregnancy has been decided upon, it may be that "sterilization" is desired, and under such circumstances, the procedure in good hands which will cause the patient the least shock, will be an abdominal hysterotomy together with partial excision of the tubes, and peritonization of their ends.

Under no circumstances must a tuberculous woman be allowed to nurse, and she must be cautioned with great firmness against the occurrence of an early repeated pregnancy. Because of the seriousness of tuberculosis associated with pregnancy, tuberculous women should not marry unless both husband and wife clearly understand that pregnancy must be avoided at all costs, until health is thoroughly restored.

Heart Disease and Pregnancy.—The first duty of the physician is to decide whether or not a heart that has been, or is, the seat of an endocarditis is performing its work satisfactorily both when the individual is at rest as well as when she is engaged in reasonable exercise. The presence of abnormal signs alone gives no indication of the actual efficiency of the heart. If in the nonpregnant state the heart withstands reasonably well the normal burden of everyday life, there is no reason why, in the majority of cases of pregnancy *not* complicated by other conditions, it should not also function satisfactorily, at least, with proper observation and care.

One of the great lessons to be borne in mind in this connection, as so ably testified to by Sir James Mackenzie and others, is "that no *single sign* shown by the heart itself, however abnormal it may seem, should either be a bar to pregnancy or a basis for prognosis."

The proper interpretation of heart signs requires prolonged study, a level head, and plenty of human understanding. The internist is alone competent—and not every internist—to handle the problem of heart disease associated with pregnancy. The internist and the obstetrician must work hand in hand and each in his own province is of the greatest help to the other. Mackenzie in his study, *Heart Disease and Pregnancy,* has so ably pictured the various angles of the medical problem that I feel that his words will present in clear and masterly manner the outstanding lessons we all need to heed closely. I, therefore, quote him at length:

"As the danger attending women with heart disease, is the *occurrence of heart failure,* the physician must keep clearly before him the symptoms by which this can be recognized.

"The absence of a clear conception of the nature of these symptoms has too often led to a misunderstanding of their significance. No single sign manifested by the heart itself gives information as to the functional efficiency of the organ, and consequently the signs of heart failure must be looked for in other directions and more especially in those structures whose blood-supply is likely to be reduced by the weakening of the circulation.

"Extreme heart failure is shown by such signs as dropsy, enlargement of the liver, œdema of the bases of the lungs, or cyanosis.

"Early heart failure may be revealed by no sign when the body is at rest, and may only be discovered by distress evoked when some effort is made which the patient was wont formerly to perform in comfort.

"The signs of distress, so far as women in the child-bearing period are concerned, are breathlessness and palpitation. Pains on effort may be present in certain cases of mitral stenosis and aortic disease; but, as a rule, the pain of grave heart failure is a sign which occurs much later in life.

"From this it follows that *no single sign* shown by the heart itself, however abnormal it may seem, should *be a bar to pregnancy.*

"Systolic murmurs, no matter in which area they are loudest, should never be a cause of anxiety in pregnancy. If they occur in hearts which show no other abnormal sign, and if the patient's

response to effort is good, they should be ignored. If they are associated with other signs of heart disease, the prognosis should be based on these other signs and not on the systolic murmurs.

"The same rule applies to the irregular actions of the heart due to respiratory arhythmia and extra-systoles.

"In women with easily excitable hearts, who suffer at times from pain of varying degrees of severity (the neurotic heart or the toxic heart), when the organ is normal in size, or only slightly enlarged, the heart trouble constitutes no bar to pregnancy. This applies whether systolic murmurs are present or not.

"The form of heart disease which gives most occasion for anxiety in pregnant women is mitral stenosis. This usually has followed an attack of rheumatic fever. In such cases great care must be taken to differentiate between dangerous and not dangerous forms of the malady. The latter include instances in which the cicatrizing process, which produces the stenosis, is stationary or is only progressing slowly. Such slow progress is shown by the character of the murmur. If there is present, ten or fifteen years after the causative attack of rheumatic fever, only a presystolic murmur, and if the heart's size is normal, its rate regular, and the response of the patient to effort good, then pregnancy may be undertaken with fair prospect of safety.

"If, on the other hand, there is present, within a few years of the causative attack of rheumatic fever, a diastolic murmur as well as a presystolic, there will be danger. This will be particularly the case when there is evidence also of the heart muscle being damaged, *i. e.*, enlargement of the organ and much distress on effort. When in addition to the mitral stenosis there is fibrillation of the auricle, pregnancy should be forbidden. If pregnancy has taken place, then the case should be watched; and if grave signs of heart failure occur, the pregnancy should be terminated.

"In cases of aortic regurgitation, if the heart is normal in size and the response to effort is good, pregnancy may be undertaken. If, on the other hand, the ventricle is much hypertrophied, and there is a marked 'Corrigan' pulse, the probability is that the heart will be so permanently impaired that it will cripple the patient severely if she gets over her confinement."

Treatment.—The pregnant patient with a suspicious heart, should be examined every week or two. It is absolutely essential to have close coöperation between the patient and physician. With such under-

standing, and with due care and due regard for the primary principles of prenatal care, the majority of patients will weather the storm successfully. Alcohol, tea, coffee and undue excitement, must all be avoided. The intestinal tract and the kidneys need particular attention. Rest will probably accomplish more than any one other single measure, and the amount of such rest will naturally vary, with each individual. In the marked cases, particularly of mitral stenosis, patients may have to be kept at rest a great part of the time. The great majority of cases, however, may safely indulge in moderate exercise, and all should be in the fresh air as much as possible.

Decompensation may occur at any time during pregnancy or labor or even after labor, and the drug, par excellence, is unquestionably digitalis. This drug is given in moderate doses until some effect is noticed. In those cases with early symptoms of decompensation, 10 to 15 drops of the regular tincture are administered three or four times a day until results are obtained. Should this prove insufficient to obtain a definite change or should the symptoms become more marked, large doses will, of course, have to be used temporarily, that is, probably from one to three days. These larger doses would consist in using from 30 to 60 drops at a time. Naturally no hard and fast rule can be made.

In the presence of acute decompensation with edema of the lungs, nothing accomplishes so much good as phlebotomy. A considerable amount of blood must be withdrawn in order to get a definite reduction in venous pressure. At the same time either morphin, grains ¼, or some hypodermic form of digitalis or caffein are essential. If there is marked rise in blood-pressure, some arterial dilator such as nitroglycerin should be used. All cases that pass through the acute stage should be treated conservatively both as to diet, rest, and drugs. Exercise must be indulged in but slowly and little at a time. At the time of labor, the patient's nervous system should be quieted and the labor rendered as easy as possible. Rubber bags will often materially aid in the dilation of the cervix, and the second stage should not be allowed to be prolonged. Both forceps and version are of definite value, depending on the conditions present at the time. In certain cases, either because of the weakness of the individual or in order to insure a live baby, a cesarean section may be indicated. It is well to remember, however, that both after a cesarean section or after a version—the uterus being emptied rapidly and intra-abdominal pressure being suddenly greatly diminished—a tight ab-

dominal binder should be applied at once. Ether is the anesthetic of choice and in this country, at least, is very generally regarded as superior to any other. Rectal anesthesia is here, too, most serviceable. Scopolamin and morphin in either difficult labors, or in very neurotic women, may be advantageously used. The physician and nurse should not forget that even after an apparently successful labor, the patient suffering from an endocarditis may still suddenly die of a pulmonary or cerebral embolism, or from auricular fibrillation.

Approximately 20 per cent of the more severe cardiac cases have their pregnancy terminated in either abortion or premature labor. This may come from either accidental hemorrhage or thromboses in the placenta, or as result of death of the fetus.

Interruption of Pregnancy in Cardiac Disease.—In the average case of not too great severity, if cardiac compensation is good, and the patient is in full coöperation with her physician, interruption of pregnancy is unnecessary. On the other hand, if the patient shows increasing signs of failing compensation, *despite medical help,* interruption of pregnancy may be the only course to pursue. Should such failure of compensation occur early in pregnancy, most observers advise terminating the pregnancy with the least shock to the patient. Later on, in the presence of a long, tough cervix, interference is so difficult and labor so long that, in many cases, the part of wisdom would seem to be to rely upon either an abdominal or a vaginal cesarean section. With a soft, easily dilatable cervix, on the other hand, the slower method with bags and forceps or version, should be used. *Rapid termination of pregnancy at the height of decompensation is usually fatal.*

In closing, a word of warning is needed against confusing the tachycardia so often seen at different times in pregnancy, with heart disease. Such tachycardia may come from temporary, perverted thyroid activity, from abdominal pressure, from a neurotic heart, etc., but it is not due as a rule to heart disease.

Tachycardia not associated with a heart lesion is best treated with rest, plenty of it, and with an abundance of fresh air. Sodium bromid, adalin, or luminol at night will often be of material help. Both the tachycardia and arythmia of pregnancy (uncomplicated) will respond not infrequently, in my own experience, to small doses of thyroid extract.

After-Effects.—It is always difficult to state beforehand just how great the damage will be from pregnancy upon the heart which is the

seat of endocarditis. In the average case of moderate severity we feel—and this has certainly been the experience of Herrick at the Sloane Hospital for Women, and of Pardee at the New York Lying-In Hospital—that this damage is not a permanent one providing careful oversight has been observed during the pregnancy and labor and the first few weeks after the birth of the child. However, in cases with unscientific management or in the less common cases of marked severity, the damage may be very real in character with the ensuing of either death or definite invalidism.

Pyelitis.—An overwhelming majority of cases of pyelitis of pregnancy, other than those due to renal calculus or influenza have their active origin, at least, in the state of the intestinal tract; and care of the intestinal tract, with the free use of water and abundant colonic irrigations at the earliest suspicious signs of disturbance in the urine, will usually prevent serious complication.

Pyelitis is not at all uncommon during pregnancy and is, as has just been said, largely dependent upon improper intestinal elimination, increase of colon bacilli and, in considerable measure, upon pressure from the gravid uterus together with a certain displacement of the bladder from the pregnancy itself. This displacement of the bladder accompanies the growing uterus, chiefly because the latter has a tendency to undergo axial rotation.

As a result of this change in position there is not infrequently a certain amount of residual urine in the bladder of pregnancy. Quite recently *special* renewed stress has been placed upon this fact by Morris W. Vaux. According to him:

"A leading factor and an interesting condition which exists, as those who practice obstetrics are fully aware, is that from the early months onward the urinary bladder in pregnancy contains varying amounts of residual urine. A catheter inserted into the bladder of almost any pregnant woman immediately following the normal voiding of urine will determine a residual equal to, or larger than, the amount just voided. This complication and the persistency of it in cases of pyelitis along with the urinary findings, lead us to suppose that *here* may be found another of the attributing factors in the pyelitis of pregnancy. The symptom which causes the first annoyance to the patient generally is *frequency of urination*. The microscopic examination of the urine at this time, shows no marked excess of leucocytes or bacteria. There is no evidence manifested of systematic involvement either in pulse, temperature or blood examination. The primary

symptoms are associated in the bladder, in my experience, with a varying degree of residual urine and never at any time in this series of cases was it possible to procure in blood culture a growth that might lead to the positive proof of a blood stream infection.

"In my series, cystoscopic examination showed the right kidney to be involved in each instance. Many times the early symptoms of pyelitis are so transient and unnoteworthy from the patient's point of view that they are entirely ignored. If such be the case the condition is allowed to continue until it is so evident that associated analysis and studies are of little or no value, other than to prove the seriousness and magnitude of damage done in the organs involved. The early frequency of urination, whether on the feet or in bed, is such a common complaint by the patient as to often be dismissed with little or no treatment to rectify this distressing and harassing condition."

Harbeck Halstead in 24 cases found 22 with a colon bacillus culture from kidney catheterization; 17 of the 24 showed some involvement of both kidneys, one patient had a pyelonephritis and another developed a perinephritic abscess.[1]

In my own experience, cases of acute pyelitis usually give a warning in the urine if this is carefully studied. For several days, or even many days before the onset of active symptoms, there is usually marked excess of indican, a trace of albumin, clumped pus cells, and many bacteria.

The symptoms may be gradual and slight, or quite acute in their onset, with a stiff temperature reaction of the up and down type, for many days. The average severe case lasts from 10 to 21 days with temperature often going to 102 to 104° Fahrenheit or higher. There is usually some discomfort and actual pain in the kidney region and practically always, as an early symptom, bladder irritability. Pyelitis occurring a few days postpartum has its origin as a rule before labor, or in the atonic intestine of the postpartum patient.

The treatment of these cases aims to make the patient as comfortable as possible and to establish free elimination from the kidney. Regarding the position that the patient should assume in bed, there is considerable difference of opinion. Some use the Fowler position, some raise the head of the bed, and some advise the knee-chest position, three or four times a day for five to ten minutes. The intestines should be given free purgation with salines and colonic

[1] From the clinic of the Sloane Hospital for Women.

irrigations of from 12 to 16 quarts of water should be instituted daily until marked improvement is seen. One adds a dram or more of bicarbonate of soda to the pint of water. These irrigations relieve the symptoms more quickly than any other one single factor. They must be given slowly and exceedingly gently, so as not to disturb the pregnancy. The irritability of the bladder in the early days may be controlled further by the use of sandalwood oil, 10 drops, in capsules, 3 times a day. If this is too irritating to the stomach, try large doses of potassium citrate, from 60 to 120 grains in the 24 hours. As the condition subsides in severity, urotropin in 10- to 15-grain doses, 3 times a day, alternating with acid sodium phosphate, grains 15 to 20, will often help to clear up the persistent pus in the specimens. Of late much interest is attached to a new drug—caprokol—which is given in grain 15 doses. Catheterization of the pelvis of the kidney is only necessary in cases where it is self-evident, from persistent kidney pain or persistently high temperature, that the kidney is not draining. In certain of these severe cases, however, the mere passage of the catheter will establish proper drainage and will quickly bring down the temperature. Irrigation of the kidney pelvis under these particular circumstances of pregnancy is seldom necessary, even if the catheterization is carried out.

In some cases of short duration, the pus disappears quickly from the urine but in many others, pus cells and great numbers of bacteria are very persistent even though all other symptoms may have disappeared. In some of the subacute or chronic cases, a vaccine may be of definite value. The interruption of pregnancy is but seldom required, although after the completion of labor it is undoubtedly true that the average pyelitis of mild grade will rapidly clear up.

The prognosis is good. One attack of pyelitis does not form an excuse for interrupting a subsequent pregnancy, but it does mean that in case a subsequent pregnancy occurs, watchful care of the diet and kidneys and intestinal tract should be instituted at an early date.

For the sake of clarity, it is well to repeat here that the colon bacillus is the infecting organism in the majority of cases, although it is taught by some, that the attack may be due to a pyogenic organism from some focus of infection, as an alveolar abscess or infected tonsils.

The Toxemias of Pregnancy.—The toxemias of pregnancy may be mild or severe; they may be with or without convulsions; they

may come on suddenly with very little warning; or the development may be gradual. The latter is particularly true in cases that have been suffering from chronic nephritis. (See Kosmak, *Toxemias of Pregnancy*, Gynecological and Obstetrical Monographs, for a complete analysis.

The patient should be put to bed at once and kept quiet, even if the first objective symptom is a change in the blood-pressure, that is at all marked. Other early signs of disturbance may be:

1. Repeated headaches
2. Dizziness; blurring of vision
3. Repeated vomiting
4. Puffiness about face and hands and feet
5. Neuralgic pain
6. Unusual irritability
7. Urinary changes, particularly:
   (*a*) Marked lessening in total quantity
   (*b*) Definite albumin
   (*c*) Casts and red blood cells

TREATMENT.—The diet should consist of milk toast, carefully cooked cereal, vegetable purées (not beans or peas), and baked potato. Salt should be restricted or eliminated entirely. Some physicians advise fruit juices.

The patient should drink water freely. The old "Imperial" drink, despite many innovations, is still good to-day. It consists of cream of tartar, one teaspoonful; juice of one half a lemon; water, one pint; sugar, q. s.

With more or less generalized edema, it is advisable to modify temporarily, the intake of water for 3 or 4 days. In these cases, as in certain cardiac cases, the Karrel diet for 2 to 3 days should help. This plan gives one quart of milk per day, with no other food, except fruit, and no water. The skin should be kept warm. Hot packs and hot baths are used less than formerly as it has been supposedly demonstrated that they do no great amount of good. It is still too soon, however, to condemn them entirely. The intestinal tract should be properly cared for, but actual purging is not necessary. Epsom salts are still, to-day, as efficacious as thirty years ago. Colon irrigations are invaluable. These should be hot, of at least 12 to 16 quarts in amount; they should be given as high as possible and very gently. Bicarbonate of soda, one teaspoonful to the pint is commonly used. In many cases a solution of glucose by rectum is beneficial.

If, despite this treatment, the albumin and casts increase, or the total 24-hour quantity markedly decreases; if edema is present in increasing amount, and if the blood-pressure goes to 175 or 180 mm. Hg. and stays there or rises above this, even, the patient, in my opinion, should be delivered as conservatively as possible.

In cases of acute severity with sudden onset and convulsions, the treatment in addition to what has just been outlined, will depend entirely upon the surroundings of the patient and the experience of the medical attendant. All severe cases, where it is at all possible, should be in a hospital. Accouchement forcé, to-day, is practically tabooed, but there exist to-day, two different schools of action in the convulsive cases: (1) the ultraconservative as represented by the Stroganoff and Dublin schools and (2) the semiconservative.

The writer belongs to the latter group. He does not believe in unnecessary trauma, in needless shock; but he firmly believes that an experienced accoucheur will obtain as good maternal results and better infant results by the induction of labor with bag and packing, together with the generally accepted therapeutic procedures mentioned above. In certain exceptional cases, a cesarean section may be demanded, but, on the whole, results do not warrant this operative interference. A doctor should be in constant attendance on a patient during the convulsive stage. Chloroform should not be used either for the convulsions or for the delivery. If an anesthetic is required, ether is the most satisfactory. With a bounding pulse, venesection is invaluable. From 500 to 1000 cubic centimeters may be removed.

Despite the writer's preference for this combined medical treatment and induction of labor, he yet feels that the slower methods about to be described, are far safer for the mother in the hands of the average practitioner.

Stroganoff Treatment.—Morphin, grain ¼ is given when first seen.

After one hour, chloral hydrate, grains 30, in 250 cubic centimeters of salt solution.

After 3 hours morphin, grain ¼, is again given.

After 7 hours, chloral hydrate, grains 30.

After 13 hours, chloral hydrate, grains 20.

After 21 hours chloral hydrate, grains 20.

If more than three convulsions occur, 400 cubic centimeters of blood are removed.

Stroganoff has collected 2,208 cases with 9.8 per cent mortality

for the mother and in 230 cases, a mortality of 1.7 per cent. Fetal mortality is in the neighborhood of 50 per cent.

The Dublin Method.—Morphin, chloral hydrate, and chloroform are not used. The delivery is effected only after complete dilation. This method relies entirely upon:

1. Starvation
2. Lavage, and Epsom salts
3. Colon irrigations

In 204 cases by this method, there was a mortality of 10.3 per cent.

While it is the purpose of this monograph merely to discuss the *practical aspects* of the conditions arising during pregnancy and labor, yet it is important again and again to lay the greatest emphasis upon the damage both to mother and child by this complication. We are dealing here, with a disease which involves a number of important organs in the body of the mother, a disease which may readily kill or if it does not actually destroy life, lays the foundation, time after time, for prolonged invalidism. Similar organic injury will often come to the infant; and stillbirth, or early infant death, is all too frequently dependent thereon.

Prenatal care has accomplished so much in this particular field by lowering maternal mortality to an insignificant percentage, that it would justify itself if it had accomplished nothing else.

In a small group of cases, eclampsia is followed by definite mental derangement, which may persist for many months. In others, ocular disturbances due to edema, or actual hemorrhagic retinitis, are not uncommonly seen. Albuminuric retinitis is more directly associated with the toxemic conditions of old chronic kidney conditions. In such cases, the clearing up of the condition may be exceedingly slow.

Eclampsia, not based on a preëxisting kidney condition, seldom if ever, predisposes to a second attack in a subsequent pregnancy.

Disorders of the Nervous System.—The parturient woman is inclined to be more nervous than usual. Little things not infrequently irritate her unreasonably. At certain stages of the pregnancy, there often develops a feeling of anxiety or of actual depression, and it is then that oversympathetic friends or relations repeatedly do harm in the advice given. She not infrequently takes strong personal dislikes, such dislikes all too often being directed against those whom she should love most. In this state of mind, the husband is the one

who most frequently is the object of unrest. The middle months of the pregnancy are as a rule the freest from such intense abnormal states of mind.

This psychological upheaval is in part due to lowered vitality *per se,* in part to endocrine changes, in part to selfishness, and in part to physical aversion towards the husband.

Fear should be eliminated; encouragement should be given; guidance in right thinking is absolutely essential; and the general health should be improved.

Cases developing a severe form of depression may even threaten to commit suicide. Extreme cases occasionally will need to have the pregnancy terminated. In this, however, the greatest caution is necessary for even experts in psychology may be deceived by the state of mind of these patients. Most of them clear up quickly after the uterus has been emptied, but not all. In cases where the mental depression is entirely genuine, or where there has been too great delay in the emptying of the uterus, many months may elapse before a total recovery takes place. The cases of so-called puerperal insanity rarely are seen until either late in a prolonged labor or until some time in the puerperium. These may be very severe in character, and occasionally result in death; but, as a rule, they result in total recovery even though such recovery may be delayed for from one to two years or more. Most of these probably have an endocrinopathic origin, although some are of the opinion that they are the result of septic infection in some form.

In as much as this is a survey from the standpoint of prevention, the writer wishes merely to impress his readers with the fact that acute melancholia or acute mania is always possible at any time during the pregnancy, labor, or the puerperium, and that, this being the case, all cases of even mild depression should receive proper care. The cases of acute mania, we repeat, are more common at the end of a hard labor or during the puerperium than in pregnancy and, therefore, no case that is in the least suspicious, should be left unguarded. Prenatal care cannot altogether prevent this state of mind, but it should lessen the frequency and severity.

Puerperal insanity is rarely seen excepting in an individual primarily of unstable nervous system. The severe cases naturally demand the care of an experienced alienist and usually for the time being, require institutional care.

Every patient who has recovered from such attack must be warned

against an early repeated pregnancy. The husband must be convinced of the risk. Time and right living, alone, can offer hope for future pregnancies, even after apparently complete convalescence.

Pelvic Tumors.—In the presence of tumors in the pelvis, general principles have already been laid down in numerous, modern text-books, and should be followed. A short survey of certain outstanding features, however, will not be amiss. The two varieties we wish briefly to discuss are (1) tumors or cysts of the ovary and (2) uterine myomata.

Tumors or Cysts of the Ovary.—Cystomata, or tumors of the ovary, are rather more likely to have their circulation interfered with during pregnancy, than are the tumors of the uterus. Being as a rule pedunculated, they are more apt to become either partially or completely strangulated and in consequence demand immediate operation.

It is owing to the possibility of a sudden twist in the pedicle, in the presence of an apparently fairly harmless cystoma that the majority of obstetricians feel this condition, if not removed early in pregnancy, demands close watching. A change may appear without warning and without discoverable cause. Such cysts or tumors not infrequently cause dystocia during labor as a result of becoming caught in the pelvis alongside of or in front of the presenting part.

The general opinion, seems to be, that during the first four or five months of pregnancy, it is well to remove such growths, unless they are so small that they may be practically negligible. I naturally do not refer to the ordinary "cystic ovary." In the latter part of pregnancy, however, it would appear wiser to be conservative, owing to the greater difficulty of the operation, and not to operate unless active symptoms supervene.

If an ovarian tumor obstructs the labor and if it cannot be displaced out of the pelvis, a cesarean section, and ovariotomy should be done. Certain operators, on the other hand, would perform the ovariotomy and permit the patient to deliver herself.

In the puerperium, a tumor that has not obstructed the labor, or that is giving no symptoms, should be left alone until convalescence is thoroughly established. While abortion is not uncommon following operation during pregnancy, still many cases have been operated on without ill effects. Quite a group of double ovariotomies, usually for dermoid cysts, have been reported with satisfactory results. The chief features at operation to keep in mind are that the uterus should

be handled as little as possible and the abdominal wall closed most carefully.

After operation, opium in some form during the first few days, should be employed freely. The writer again wishes to state that the simple, moderately enlarged cystic ovaries discovered in early pregnancy should be left alone. To remove all such, from the standpoint of the patient, is almost criminal. On the other hand, from time to time, an apparently simple cystoma, the size of a very small egg, may suddenly have its circulation interfered with and in a few hours grow to amazing proportions.

In these acutely developing cases—rare to be sure—there is intense pain, vomiting, and marked prostration. Obviously, operation is the only choice.

Uterine Myomata.—Tumors of the uterus, and these are ordinarily fibromyomata, aside from increasing the danger of abortion, of premature delivery, or of "abruptio placentæ," usually do not cause serious trouble during pregnancy, and do not call for active treatment. These growths vary greatly in size, in number, and in location. As a general principle it may be said that tumors in the lower zone are the most likely to increase in size during pregnancy, and give the greatest trouble at delivery. Should one or more such growths increase rapidly in size, or become unduly painful and tender, operation during pregnancy may be demanded, and, in many cases, myomectomy may be safely carried out. It is only in the presence of severe symptoms, due to the size or multiplicity of the growths, or to severe bleeding, that hysterectomy is necessary. Opium in large doses is demanded, when myomectomy is performed during pregnancy.

A moderate sized fibroid complicating early pregnancy will practically never justify an artificial abortion. (On the other hand, multiple myomata may justify this procedure.) Both on moral and medical grounds this should be largely avoided. Technically, emptying the uterus after the second or third month, from below, when the tumor is in the lower segment, is often extremely difficult.

The majority of women with the general type and size of tumor commonly met with, *can pass safely* through pregnancy without operation; but at the *time of labor*, great care is demanded, particularly with a sizable growth in the lower zone, and no one but an expert where it is at all possible to have one, should undertake the delivery unless the condition unexpectedly resolves itself into a relatively simple one. Many cases deliver themselves spontaneously or with

a moderate amount of help. A version will often solve the problem most satisfactorily in simple obstruction. But it is unquestionably true, all things being equal, that given the choice between cesarean section and a long, hard delivery from below, the former is preferable. In the one case, one is assured of a live baby and usually a

Fig. 3.—Multilocular Dermoid Cyst of the Ovary and Pregnancy. The tumor from its position would interfere with labor. If it cannot be displaced upwards, a cesarean section is mandatory. (Bumm)

live mother. In the other, the baby often succumbs and not infrequently, the mother, too, from hemorrhage and shock and from sepsis, somewhat later, due to a sloughing tumor. Watchfulness, then is ever the keynote to success and ultraconservatism, in this particular group, is impossible.

As to whether or not to operate upon fibromyomata in the puerperium will depend entirely upon whether there are symptoms of necrosis, persistent pain, temperature, etc. It is preferable, as in the case of cystomata, to defer operation until involution of the uterus is as complete as possible, and by so doing, it will be found that the growth or growths not infrequently will have diminished to an amazing degree.

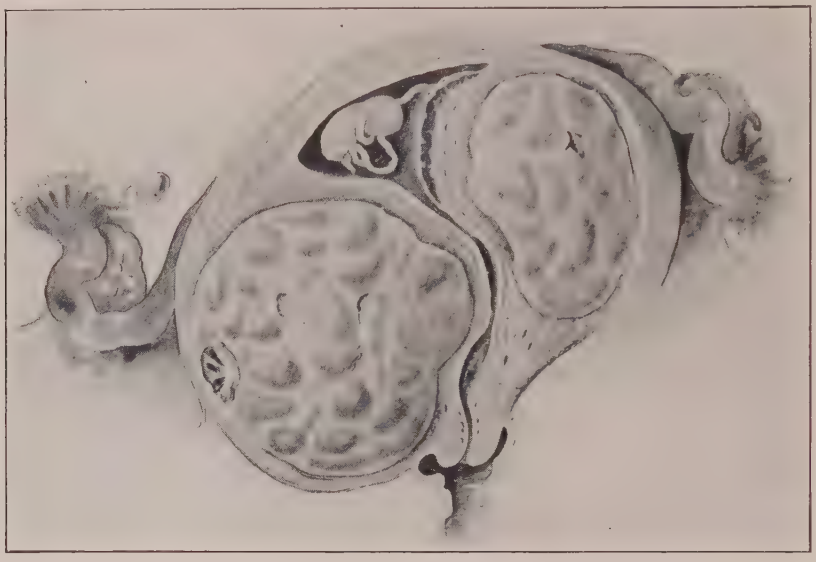


Fig. 4.—Multiple Myomata of the Uterus and Early Pregnancy. In this case, pregnancy would not advance normally. (Bumm)

Abortion.—In a study of this kind we are endeavoring, as far as the infant is concerned, to lessen the needless loss of life from abortions or from so-called "prematurity."

The causes of both spontaneous abortion and prematurity are varied, sometimes easily understandable, more often difficult of explanation. The occurrence, as we have seen in the previous chapter, is very common and the after-effects are all too frequently unsatisfactory, largely due to the failure to take the average case seriously enough. The highest estimated rate is that of Janssig's, who thinks that there is an abortion for every 3.2 per cent of labors. Adair in 2,000 cases, all of which had prenatal care, had 89 abortions and 74 threatened abortions, in which, however, the women were carried through to the period of viability of the infant.

The most common causes of abortion are fatigue of no matter

what origin, falls, motoring on bad roads, horseback riding, gonorrhea and other infection, and intercourse.

Spontaneous abortions are most liable to occur at the normal menstrual cycle or as a result of neglect at such time. They frequently result from poor maternal health, and probably may be influenced by the state of the father's health at the time of conception.

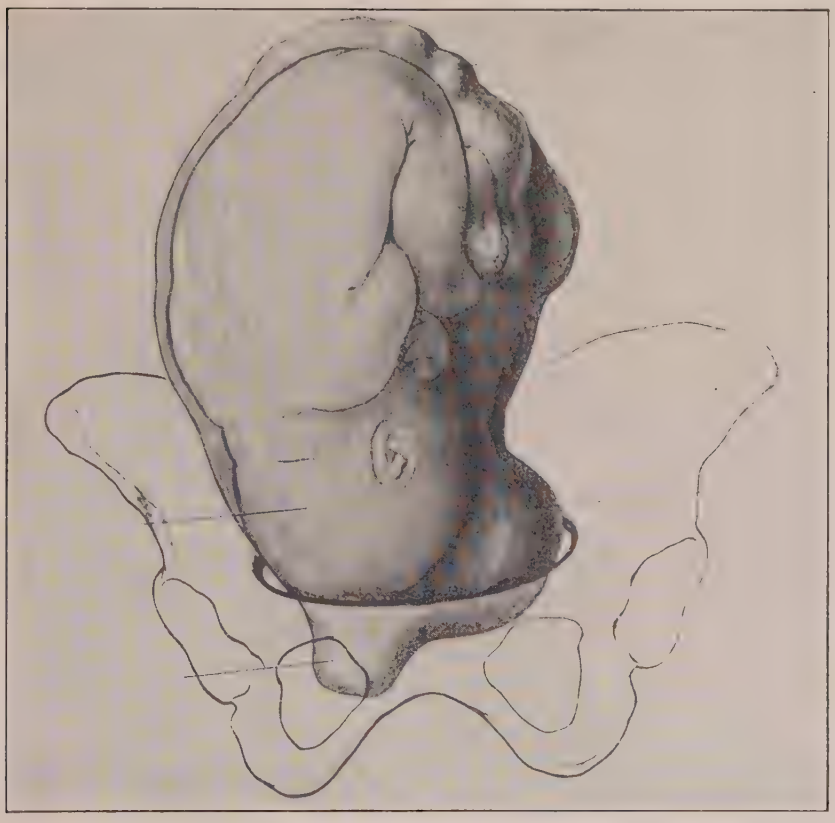


FIG. 5.—DIAGRAMMATIC ILLUSTRATION OF MULTIPLE MYOMATA AND PREGNANCY. The cervix is closed and one tumor partially blocks the fetal head. (Bumm)

Not uncommonly they are due to imperfect development of the embryo; to a poor, or low, implantation of the placenta; to retrodisplacements of the uterus; to bad lacerations of the cervix, to a previous "cervical" amputation, or to pelvic tumors.

Criminal abortions are always accompanied with great risk to the patient. They are terribly destructive to both health and life.

From the standpoint of prenatal care, one should learn to regard any and all bleeding or bloody discharge during pregnancy, as a

danger signal not to be neglected. Pain added to a bloody discharge means greater danger. On the first appearance of either, *order rest.*

The one great preventative is *complete rest and quiet in bed.* In the presence of backache or pelvic pain, opium in some form is the most reliable remedy. Many believe in the use of an ice bag; some do not.

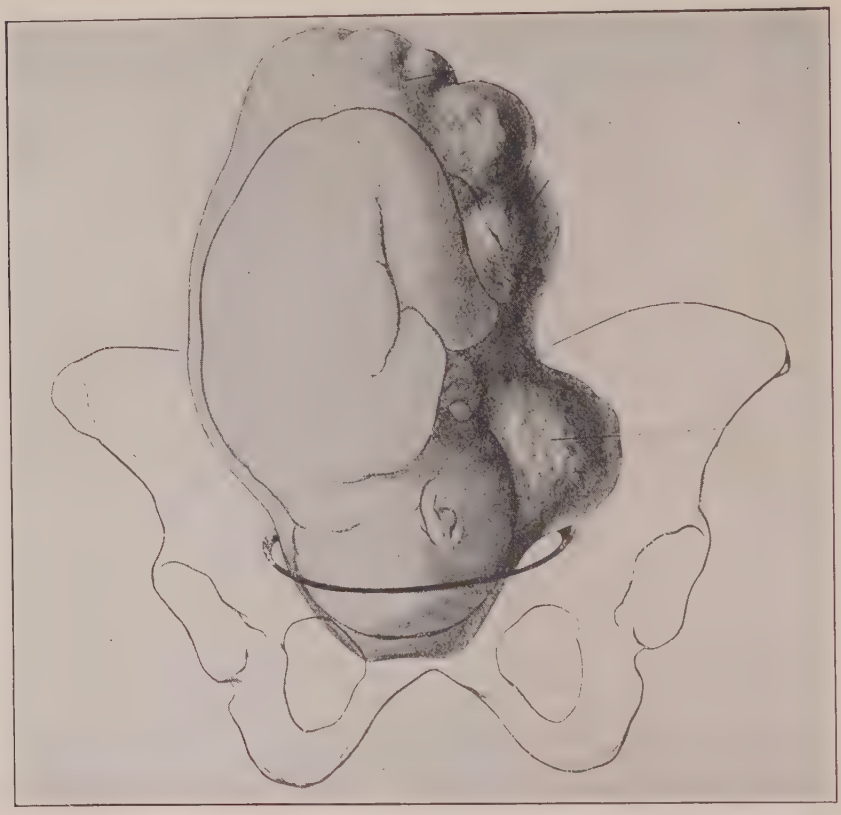


FIG. 6.—DIAGRAMMATIC ILLUSTRATION OF MULTIPLE MYOMATA AND PREGNANCY. This shows the method by which Nature at her best, draws upward a "lower zone myoma" during labor and thus allows a delivery from below. (Bumm)

The cases of moderate severity will quiet down *providing that the patient takes to her bed at once.* This simple procedure will save the majority of cases providing *fetal life is still present* at the time of the early symptoms and providing the damage at the onset is slight. An internal examination had better not be made at the beginning, unless there is strong suspicion of an extra-uterine pregnancy; in fact, any internal examination unless *most gently* given,

is likely to be disastrous. *Too great stress, then, cannot be laid upon this point and any such examination should be carried out with one finger.*

The two features that the writer desires particularly to call attention to are:

1. The need of taking every case seriously at the *onset;*

2. That prolonged rest in bed and great patience will often save the day and later bring a normal child into the world, even though the staining persist for many days. Too great haste in emptying the uterus is constantly causing needless sacrifice.

The danger of abortion decreases ordinarily after the twelfth to the fourteenth week of gestation; that is, after the actual formation of the placenta.

In cases of interruption of pregnancy in the early months, bleeding is rarely severe, but at times, even as early as two and a half or three months, it may be quite intense. Under such circumstances, of course, one cannot rely upon simple measures. Packing, or the immediate emptying of the uterus with the gloved finger—if the cervix is dilated—or with a sponge holder, is demanded. Quinine and pituitrin will prove of material help.

The greatest cause of death from miscarriage is sepsis in some form, and probably it is also true, that neglected miscarriages form one of the large groups of etiological factors in prolonged ill health. At all times it is absolutely obligatory to bear in mind, in the radical treatment of miscarriages, that perfect asepsis is necessary and that it is criminal to be negligent in this matter.

As is the case in difficult cases of labor, it is vastly safer for the patient to be in a hospital, if hospital facilities are possible. The writer is well aware, however, of the fact that nearly one half of the counties of this country are quite devoid of hospital facilities.

In the treatment of abortion one should never forget the three great dangers of the curet:

1. Perforation of the uterus
2. Excessive bleeding
3. Sepsis

Prenatal care can do a great deal to lessen the number of abortions and premature labors, and the sooner such care is instituted the better will be the results.

Reviewing briefly, then, the management of these early cases, we

conclude that conservatism will "save" many a pregnancy; that a goodly number of abortions require *no* gynecological interference; that tamponing the cervix and vagina will be all the interference demanded in many instances. Such treatment must be conducted with "true asepsis" and only sterile gauze, or sterile bismuth or iodoform gauze used. Incomplete cases with temperature, excepting in the hands of the specialist, are probably either best treated by simple tamponage of the uterus for 24 to 36 hours or treated with hot douches (vaginal), elevation of head of the bed, pituitrin in small doses, ice-bag, and supportive measures.

Intra-uterine Death of the Fetus.—1. *Essential Factors in Causation of Fetal Death.*—Intra-uterine death of the fetus after the first 3 to 4 months is not infrequent and the etiology is all too often shrouded in mystery; still we feel reasonably sure that certain fundamental causes already known to us, are responsible for the major portion of these deaths.

The essential etiological factors in such intra-uterine deaths, as shown by J. W. Ballantyne, are:

(*a*) Various toxic conditions of the mother, such as chronic nephritis with acute exacerbation, chronic high blood-pressure, acute yellow atrophy, etc., acute toxemia with or without convulsions

(*b*) Syphilis and pyogenic infections through cord

(*c*) Premature separation of the placenta whether from a placenta normally situated or from a placenta previa

(*d*) Subnormal health of the mother, with or without chronic changes in the endometrium

(*e*) Fetal anomalies

(*f*) Abnormalities of the cord such as knots, thromboses; and a cord that is around the neck or other part of body too tightly. (This condition is occasionally seen in velumentous insertion of the cord)

(*g*) Severe acute infections of the mother such as influenza, pneumonia, typhoid, scarlet fever, measles, smallpox, etc.

(*h*) Hemorrhagic tendencies of the fetus

(*i*) Certain conditions, as yet not well understood, transmitted directly from the father

2. *Association of Fetal Death with Maceration.*—The rapidity of maceration will depend largely upon the actual cause of the fetal

death. In general, however, maceration begins within 24 to 48 hours after death. Much misinformation apparently exists as to the etiology of maceration. Syphilis has been regarded until very recently as the chief cause. As a result, however, of recent studies—and this question will be referred to in the chapter on syphilis—the opinion is now rapidly gaining favor that this disease is of far less importance as an etiological factor in maceration than has been generally taught. Maceration alone should not be taken as a positive index of fetal syphilis; it is much more likely to be associated with severe albuminuria and other nonspecific toxic conditions. The placenta in many cases will prove a guide to the determination of the underlying cause. A woman may at times carry a macerated fetus for some time with no great danger, providing the membranes are unruptured. Just why nature does not cast off the dead ovum at an early date in all cases, is hard to see.

3. *Effect of Prenatal Care on Diminution of Intra-uterine Death-Rate.*—From the standpoint of those interested in the prevention of these intra-uterine deaths, it is of great importance to know just what proportion of these may be prevented by early, *thorough* prenatal care.

The only means at our command for estimating the results of prenatal care upon such intra-uterine deaths are:

(*a*) By lessening the number and severity of all those cases that fall under the toxic group.

(*b*) By giving early and most skillful care both medically and technically to cases of hemorrhage; for repeated hemorrhages of moderate size may kill before delivery.

(*c*) By the early detection and treatment of syphilis.

(*d*) In repeated instances of death of the fetus after the seventh month, by the judicious anticipation of such death, either through the induction of labor or a cesarean section, as soon as definite viability is established.

In other words, the reduction of the fetal, intra-uterine death-rate can only be accomplished by the judicious management of the mother. The greater the care given, the lower the intra-uterine death-rate. No amount of prenatal care will probably affect the percentage of fetal abnormalities which are estimated as forming somewhat over 5 per cent of the total number.

The same holds true regarding the anomalies of the cord and the constriction of the umbilical vessels either from too tight knots in the cord, or from its position around the neck of the fetus.

Diagnosis of Fetal Death in Utero.—Antenatal diagnosis of such death is often most difficult. In fact, it is impossible in certain cases—without delay—to state positively and accurately that life is extinct, no matter what the period of gestation is.

The four chief signs that render one at once suspicious are:

1. The failure of the uterus to increase in size, or its actual shrinkage

2. The cessation of fetal movements or, at least, the failure of the mother to feel the baby move

3. The failure on the part of the medical attendant to hear either fetal heart or fetal movements

4. By x-ray examination, a finding of definite, marked, unnatural overriding of cranial bones.

Signs 2 and 3 may mislead, and yet they will offer the greatest percentage of accuracy, providing the most painstaking care is taken, and also providing repeated examinations are made over a period of several days. The first sign is accurate if carefully employed, particularly in the early months.

Other signs that may be of help are:

(*a*) The breasts not infrequently change, *viz.*, at first the glands may enlarge and may become tender, with more or less secretion. This soon passes off and the breasts rapidly diminish in size

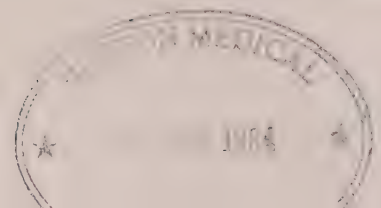
(*b*) The abdomen after a few days seems to become less tense. There is frequently a "boggy sensation" on palpation. Within a few days after the death of the fetus, the liquor amnii is absorbed in varying amounts and after 10 to 14 days, if labor has not intervened, the uterus appears distinctly smaller

(*c*) On auscultation, there is a noticeable absence of umbilical souffle.

(*d*) Vaginal examination may disclose a firmer cervix than one would expect at the stage in pregnancy

(*e*) Both acetonuria and peptonuria may be present; but both are uncertain

Hemorrhage during the Second Half of Pregnancy.—Hemorrhage during pregnancy, no matter how slight in amount, should never go unnoticed. Patients should be made to understand that at no period in pregnancy is staining with blood normal. They should be carefully instructed as to its possible danger, and as to the need



of immediately notifying the physician, or the nurse, if the former is inaccessible. They should, moreover, be instructed to go to bed at once, even when the staining is slight and to keep as calm as possible. Fear or anxiety at such times is usually quite distressing.

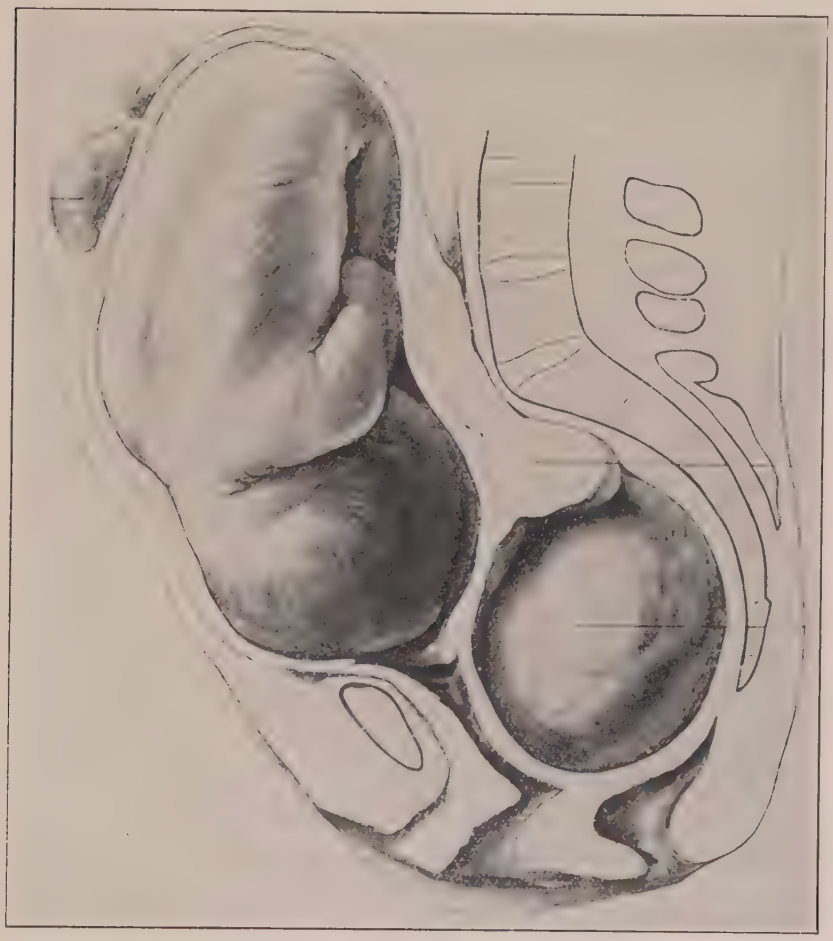


FIG. 7.—PEDUNCULATED MYOMA OF THE UTERUS AND PREGNANCY.
This tumor offers absolute obstruction, unless it can be displaced. (Bumm)

The two conditions that arise not infrequently during the late months of pregnancy that are likely to be of a severe character and that are accompanied by bleeding in some form, and, which, therefore, demand special emphasis are (1) abruptio placentæ—premature separation of a normally situated placenta, and (2) placenta prævia. Both conditions may be mild in character but in as much as there is often

difficulty in foretelling accurately the outcome of any individual case at its onset, *each one should be taken seriously.*

Abruptio Placentæ.—*Etiology.*—The commonly accepted etiological factors in this condition are toxemia, nephritis, syphilis, chronic

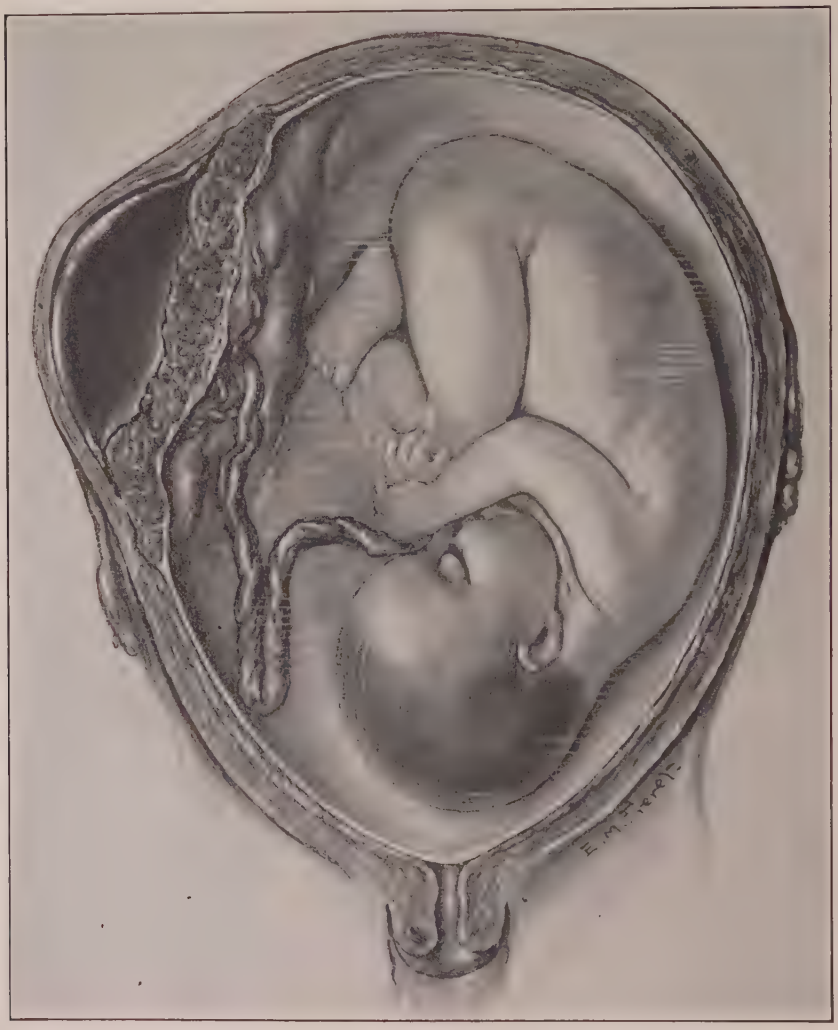


Fig. 8.—Central Separation; Concealed Hemorrhage.
(Courtesy of John D. Polak, *American Journal of Obstetrics*)

polypoid endometritis, fibromyomata, placenta marginata, certain cases of heart disease, traumatism, and overdistention of the uterus. The condition is more common among multiparæ than primiparæ.

The separation may be either partial or complete; the hemorrhage

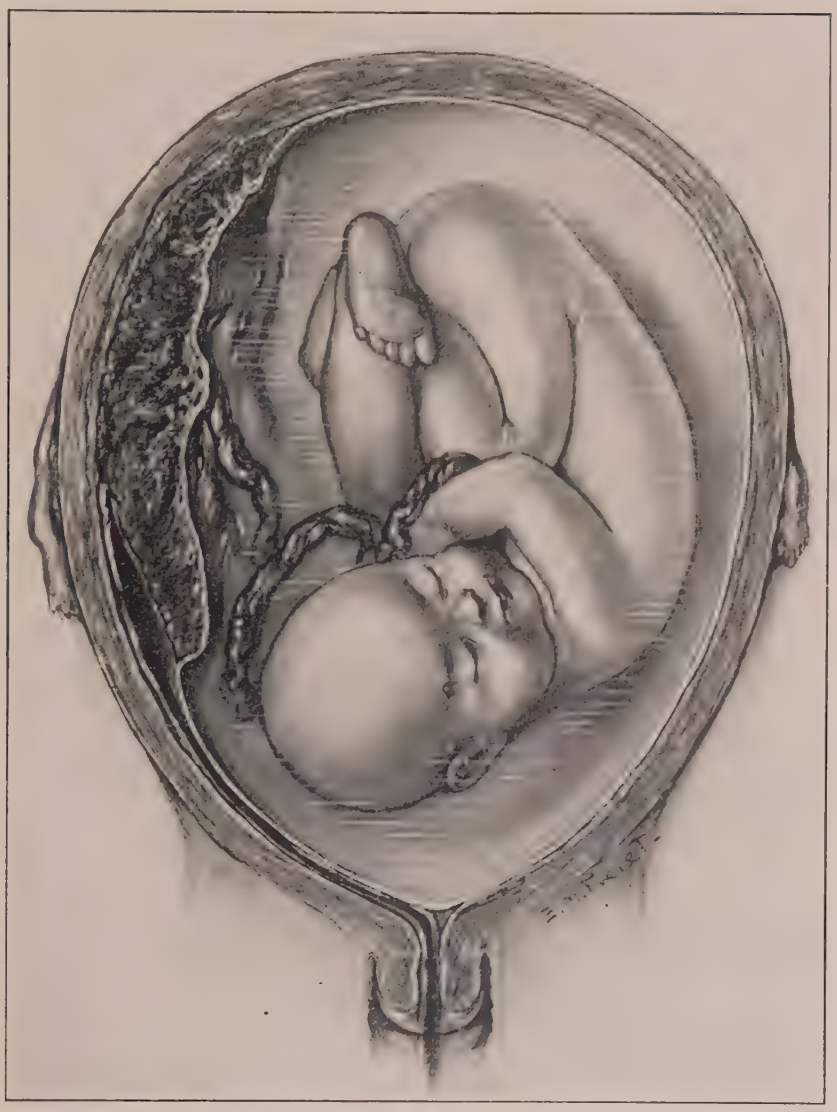


FIG. 9.—APPARENT HEMORRHAGE; PARTIAL SEPARATION. HEAD UNENGAGED. (Courtesy of John D. Polak, *American Journal of Obstetrics*)

may be entirely concealed; it may be largely external, or it may be, and usually is, both external and internal. The general types may be seen in Figures 8, 9, 10 and 11.

When the blood remains for the most part concealed, there is formed a typical retroplacental hemorrhage with the development of a blood-clot. If the hemorrhage is marked, the accumulation of blood

or blood-clot, causes an ever-increasing separation of the placenta from its attachment to the uterine wall.

Symptoms.—With the first development of bleeding, there is usually pain in one or other quadrant. The pain increases as the local-

FIG. 10.—HEAD FILLING LOWER UTERINE SEGMENT, PREVENTING ESCAPE OF BLOOD. (Courtesy of John D. Polak, *American Journal of Obstetrics*)

ized distention of the uterus increases, and may become agonizing. There is generally a show of blood externally.

The symptoms of a fairly severe case are cramp-like uterine pain usually referred to the placental site, faintness, a certain degree of

shock if the case is progressive, with an increase in the pulse rate. If the patient is examined, the uterus will be found to be sensitive, tense, firm; if the bleeding has not been great, or if it has been mostly external, the uterus may apparently be more or less flaccid and boggy over the placental side. In those cases in which there is relatively free communication between the retroplacental hemorrhage and the vagina, the bleeding may be very marked. This is the more important, because of the commonly unsatisfactory condition of the cervix. The *severe cases* develop all the symptoms of marked shock and very decided abdominal distention. Death is common. (See Fig. 11.)

In cases occurring before labor, particularly some weeks before the expected end of pregnancy, the cervix will probably be found more or less closed and still elongated. In the early stage of the bleeding, fetal movements may be tumultuous, but not infrequently, as the effects of the hemorrhage progress, the fetal movements will gradually cease, no fetal heart will be found, and death of the fetus ensues. Many instances of mild placental separation undoubtedly take place with only passing symptoms, but these we are disregarding at present and are considering only those cases that require interference, in addition to the treatment of rest in bed, with an ice-bag to the abdomen and morphin for the pain. A differential diagnosis between this condition and placenta prævia must be made as soon as possible but it is only fair to say that in those cases where the cervix is closed, or nearly so, the diagnosis is not always easy—in fact may be quite difficult.

Differential Diagnosis

Premature Separation of the Placenta	*Placenta prævia*
Toxemia often present	Toxemia usually not present
Pain present and usually increasing	Without pain unless in labor
No placenta felt through cervix	Placenta will be felt
Uterine wall tense with the concealed type	Uterine wall relaxed, unless in labor
Uterus rapidly increases in size unless the bleeding is largely external	Uterus does not increase in size
Often bulging of uterus at placental side	No such bulging
Early evidence of shock and hemorrhage	Early evidence of hemorrhage, and only later shock
Fetal death more common before delivery	Fetal death less common before delivery

Treatment.—In the *mild cases* it may be necessary merely to use rest in bed with an ice-bag and morphin, and await developments under the strictest care. In the *next group,* the moderately severe cases, interference must be resorted to. If it is possible to do so, the patient should be transferred to a hospital, the cervix dilated sufficiently to make an accurate diagnosis, the membranes ruptured, and a rubber bag introduced. The vagina may be tamponed tightly with gauze, both to stimulate contractions and to lessen the bleeding. Small, repeated doses of pituitrin would seem justifiable providing the cervix is more or less dilatable, *otherwise not,* and providing there are no pelvic contraindications to the drug. During the period of watchful waiting, the pulse and blood-pressure should be taken frequently. The hemoglobin should be estimated every two hours when possible.

This treatment will permit a large group of women to escape without too tragic an outcome. On the other hand, in the severe type of hemorrhage with symptoms becoming progressively worse, no delay at all is possible. The uterus must be emptied and emptied speedily. Certain of these patients *if in labor* with a soft dilatable cervix, may be treated by version and breech delivery. The placenta and membranes should be removed immediately, manually, and the uterus tightly tamponed with either 5 per cent iodoform gauze or bismuth gauze. In all severe cases in which the cervix is not easily dilatable, a cesarean section is demanded. In some of these, the uterus may be tamponed with gauze and not removed, but in others, owing to the marked infiltration of the uterine wall due to hemorrhagic extravasation, so much atony of the uterus exists that hysterectomy is urgently demanded.

In all cases of probable severe hemorrhage, the physician should be ready for a transfusion. If this is impossible, he should at least be prepared to use either a saline infusion or hypodermoclysis. Fetal mortality is very high, and will depend upon the period in pregnancy, upon the severity of the hemorrhage, and upon the type of operative delivery.

Placenta prævia.—The accurate diagnosis of this condition, as in the case of abruptio placentæ, will depend upon the possibility of introducing at least one finger within the cervix. Even when this is possible, the blood-clot of an accidental hemorrhage may at times be confused with placenta prævia. The differential diagnosis has just been given between these two conditions. From the standpoint of the treatment, placenta prævia may be divided into the partial and

FIG. 11.—COMPLETE SEPARATION. DISTENDED ATONIC UTERINE WALL BECOMING THINNER.
(Courtesy of John D. Polak, *American Journal of Obstetrics*)

complete variety, and into the three groups: (1) with the nonviable child; (2), with the child viable; and (3) with the child dead. The symptoms are those of hemorrhage. This may be very great. Shock appears later than in abruptio placentæ.

Treatment.—So many different views exist as to the method of choice that I must again confine myself to the presentation of what has seemed to me, and to my immediate colleagues, a safe general plan to pursue.

As soon as the diagnosis is made—indeed, as soon as bleeding occurs—absolute rest in bed should be ordered. A sedative may be given if there is undue nervousness. If there is pain and the child is still alive, but has not quite reached a period of viability, morphin should

FIG. 12.—PLACENTAL INSERTION. LOW INSERTION OF PLACENTA.
(From De Lee, *Principles and Practice of Obstetrics,* W. B. Saunders Co., Publishers)

be given. Bleeding must be carefully watched. It is too frequently minimized by both doctor and nurse in its early stages.

Conservative Treatment before Viability.—In those cases that have reached a period of time not far from the probable viability of the child, in which the child is alive and apparently normal, if there is only slight staining, *conservatism* is permissible providing the patient is either in a hospital or, if in her own home, is able to reach a doctor at short notice. A certain number of the incomplete variety of placenta prævia may thus be carried on without further interference—with the precautions just mentioned—until full viability of the child. However, if the staining continues, or if there should be intermittent staining, but with a tendency to an increase in amount, further delay is, in my judgment, unwise, and I believe, generally admitted to be unjustifiable.

Cases Demanding Active Treatment.—In the great majority of cases, active treatment should be resorted to as soon as the diagnosis

FIG. 13.—PLACENTAL INSERTION. PLACENTA PRÆVIA LATERALIS.

FIG. 14.—PLACENTAL INSERTION. PLACENTA PRÆVIA MARGINALIS.

(From De Lee, *Principles and Practice of Obstetrics,* W. B. Saunders Co., Publishers)

is made and such treatment will depend upon the facilities at hand and the experience of the individual physician. A safe plan in the presence of a cervix that is but slightly dilated is either to *tampon this* as

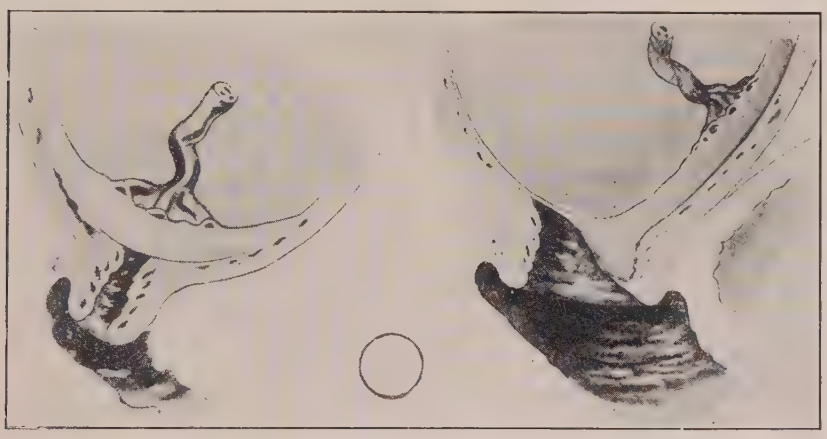


FIG. 15.—PLACENTAL INSERTION. PLACENTA PRÆVIA TOTALIS OR CENTRALIS.

FIG. 16.—PLACENTAL INSERTION. PLACENTA PRÆVIA CERVICALIS INCRETA.

(From De Lee, *Principles and Practice of Obstetrics,* W. B. Saunders Co., Publishers)

well as the vagina with iodoform or bismuth gauze or *to control the bleeding by means of a rubber bag.*

For the great mass of general practitioners who have not

had special training in modern obstetric technic, packing is much the safer procedure. This packing must, of course, be sterile and should be used after the patient has been shaved and properly prepared. The packing must be used in great abundance, otherwise it does little or no good. For those who have greater experience, and who are in possession of some form of rubber bag (we ourselves prefer the so-called Voorhees bags), this method offers a highly satisfactory mode of treatment. No matter what the treatment, let it be distinctly understood that either the physician himself or his assistant must be in constant attendance upon the patient, for severe hemorrhage and even death may take place despite either packing or bag. Of the two methods, the bag requires the closer watching, perhaps, because of the fact that if the bag slips through the cervix sooner than expected, a terrific hemorrhage may ensue.

After the cervix is either fully dilated, or dilatable, in the *mild cases,* a simple rupture of the membrane will allow the head to come down and plug the bleeding portion of the placenta, and thus stop any dangerous bleeding and labor can be finished spontaneously or perhaps with the help of gently applied forceps. In the *other cases,* however, an internal podalic version and breech extraction is the operation of choice. In certain parts of this country, as in England, the Braxton-Hicks version is popular. To my mind, however, it is far less liable to give good results, excepting in experienced hands, than internal version.

After delivery of the child, in all but the mild cases, the placenta should be removed manually, if the bleeding has not already stopped. This is not difficult in placenta prævia, and if the uterus does not contract promptly, it should be packed tightly, for every ounce of blood should be saved for the patient.

In cases where the patient is *in the hospital,* and the placenta seems to be covering completely the internal os, the bleeding considerable, *the child is alive*, and the dilatation hazardous, a cesarean section will offer much the best chance to both mother and child.

A final word of warning must be given regarding immediate delivery in patients who have lost large quantities of blood. In all severe cases, which are more or less exsanguinated, and in whom delivery is bound to be difficult, it is most important to be temporarily *conservative*. This conservatism consists in the tamponage with bags or packing as mentioned above, and the use of either transfusion, saline infusion, or hypodermoclysis before delivery. In these cases as in

accidental hemorrhage 250 cubic centimeters of gum-acacia emulsion will be of great help. This conservatism will save many a life that otherwise would be lost by immediate delivery. In the whole realm of obstetrics, there is nothing that so taxes the nerve and judgment of the attending physician as *severe hemorrhage.*

Gonorrhea during Pregnancy.—This disease is intensified by pregnancy. It is important from a prenatal standpoint for three reasons: (1) because of its etiological factor in abortion, (2) because of the danger of ophthalmia neonatorum, and (3) because of the danger of puerperal infection after delivery.

Infection of the tubes and ovaries is common in untreated cases after abortion and labor and it is not uncommon even in cases that have had treatment. It is the cause of many of the cases of so-called "one-child sterility."

There are both mild and severe cases. With the ordinary manifestations of gonorrhea there may be present in addition, pointed condylomata (verruca acuminata) of the vulva and in the vagina. The vulvovaginal glands may be involved. In the severe cases the picture is a very unattractive one; the discomfort to the patient is great and it is practically impossible to cure the disease during pregnancy. Treatment will, however, add much to the patient's immediate comfort, as well as to the safety of the ultimate outcome.

Treatment.—Many different lines of treatment are, of course, possible, but for a number of years the writer has been in the habit of proceeding in the following way:

Treatment should be begun at once; it should be active and continuous throughout the entire pregnancy, but it needs to be carried out with the *greatest gentleness.* During the early stages, daily hot douches of 1:5000 potassium permanganate solution are soothing and help to control the disease. Applications should be made to the cervix and vagina of 40 to 50 per cent argyrol or 1:2000 anilin gentian violet. The urethra may be treated with a 25 per cent solution of argyrol. Frequent bathing of the vulva is necessary.

Gonorrheal, or so-called pointed condylomata, are satisfactorily treated with an application of tincture of ferric chlorid and those on the vulva are dusted with antiseptic powder. Only small ones or isolated large ones should be excised during pregnancy. X-ray treatment, carefully given by one skilled in this particular field, will often accomplish wonders.

Abscesses of the vulvovaginal glands are opened as soon as there

is definite localization and are treated according to usual surgical methods.

It is well to recall, however, that all vulvovaginal abscesses in the absence of definite gonorrheal symptoms are not due to the gonococcus. Not infrequently slight injury to a vulvovaginal cyst will lead to infection with the ordinary pathogenic organisms. The treatment is the same.

At the time of labor the greatest precaution is necessary. Induction of labor should not be resorted to, if in any way this can be avoided. Vaginal examinations are restricted either entirely, or reduced to a minimum. Rectal examinations should be used but used carefully. If the former are employed, the patient should be on a douche pan and the gloved fingers inserted under copious irrigation with potassium permanganate, or bichlorid of mercury. At the beginning of labor and during the latter part of the first stage of labor, the vagina should be thoroughly bathed with a 25 per cent solution of argyrol.

After the birth, the baby's eyes require immediate irrigation with a fresh solution of 25 per cent argyrol or a fresh solution of one per cent silver nitrate solution, followed by normal saline solution. In those cases that are particularly open to infection, a 25 per cent solution of argyrol instillation may well be repeated every four hours for the first three days. It will, moreover, be wise to instill in the nose two or three drops of argyrol twice daily for a few days. In female infants the vulva, too, should be thoroughly treated with the argyrol.

BIBLIOGRAPHY

Herrick, W. W. Pregnancy and Heart Disease, Am. J. Obst., July, 1922.
Pardee. N. Y. State J. M., Aug., 1921.
Vaux. Am. J. Obst., Dec., 1923.

CHAPTER III

SYPHILIS IN PREGNANCY

Syphilis plays a large part in the causation of fetal and neonatal deaths but there is no doubt that the death-rate ordinarily attributed to this disease is too high. Even experienced obstetricians will inadvertently ascribe to syphilis deaths from other causes, a fact that is not surprising as the clinical evidence does not permit of accurate diagnosis even in the presence of a large placenta or a macerated fetus. With the autopsy material before one it is difficult to determine, after autolysis has occurred, the cause of the changes in the larger organs. In the long bones at the epiphyseal junction, in infants dead over 24 hours, there is edema and swelling that simulates the characteristic lesions of antenatal syphilis. There may be difficulty in determining that syphilis is the cause of death because of the presence of meningeal and nerve injuries that are the result of difficult labor. Another condition often confusing the diagnosis is the peculiar hemorrhagic disease of the newborn, in which there may be adrenal and thymic hemorrhage.

Certain students of this subject, notably Browne, have stated that before diagnosing syphilis as the cause of death in the antenatal, intranatal, and postnatal periods, the spirochete must be found in the organs, placenta, or cord.

Frequency.—The stillbirth rate that may actually be attributed to syphilis is difficult to determine and it varies with races and communities. Cruikshank mentions that the English Royal Commission on Venereal Diseases, in its study of the relationship of syphilis to fetal deaths, went so far as to say that the stillbirth rate might be accepted provisionally as an index to the prevalence of syphilis. The incidence thus indicated would, of course, be too high. Favreau, as late as 1920, said that 41 per cent of the fetal deaths are due to this disease. J. Whitridge Williams, in the same year, reported a series of 302 fetal deaths occurring in 4,000 consecutive deliveries in which syphilis was found to be responsible in 34.4 per cent. As these deaths were taken from the period of

viability in pregnancy to two weeks postpartum the figures must be considered too low, for there are infants with congenital syphilis that survive the first few weeks of life but die before the end of the first year.

In regard to the time of the onset of the symptoms we have the observations of Miller, quoted by Holt, in 1,000 cases of living babies suffering from congenital syphilis. During the first two weeks only 22 per cent showed symptoms of the disease; in the next two weeks 42 per cent of the remainder presented symptoms, or a total at the end of four weeks of 64 per cent. During the second month 12 per cent developed symptoms, giving a total at the end of the eighth week of 76 per cent. It is intimated that the remaining 24 per cent showed symptoms at various times from the eighth week to early childhood.

It is but fair to state that more moderate figures of the fetal mortality have been presented. Holland, in his report to the British Research Council, found that in 300 stillborn fetuses obtained from the hospitals of London there were 42 cases of proved syphilis, or 14 per cent. In Manhattan, one of the authors found even a lower rate —4.5 per cent—in a series of 101 deaths occurring on maternity services whose patients had received prenatal care.

Transmission of the Infection.—It was formerly thought that the transmission of active syphilis might be through the germ-plasm of the father or the mother; that is, the spermatozoön or the ovum might be infected or the spermatozoön might carry the infection to the ovum at the time of impregnation. In 1903 the *Spirochæta pallida* was discovered and the realization immediately followed that the spermatozoön could not carry a germ which is three times its size. Unless some modified form of the spirillum is discovered, the former theory of its conveyance must be discarded. Apparently the father may transfer directly to the ovum only a sexual factor damaged by the disease that he has acquired or inherited. If these seemingly logical conclusions are accepted it necessarily follows that the child is infected through its mother who has acquired syphilis.

If the mother has been infected at a period antedating her pregnancy by many years, the virulence of the organism will undoubtedly have been affected by the lapse of time so that the certainty of its transfer to the newborn is questionable. However, when the pregnancy follows shortly after the infection, the child will have con-

genital syphilis. Syphilis acquired at the time of the fruitful insemination is known as "conceptional syphilis" and results, without exception, in a luetic child; moreover, the characteristics of the disease in the

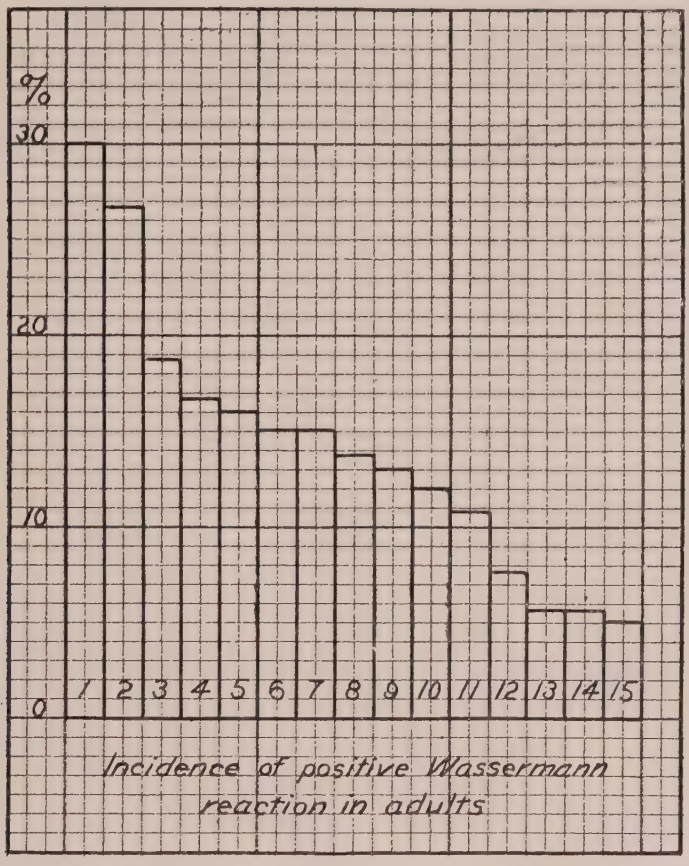


FIG. 17.—INCIDENCE OF POSITIVE WASSERMANN REACTION IN ADULTS.

1. Day and McNitt (white males, 30 per cent). 2. Rosenberger (10,212 cases, 26.4 per cent). 3. McLester (private cases, 18.8 per cent). 4. Vedder, 1916 (army recruits, 16.77 per cent). 5. Day and McNitt (white females, 16.0 per cent). 6. Vedder (candidates for police, 15.0 per cent). 7. Walker and Haller, Boston (15.0 per cent). 8. Moore, Chicago (13.4 per cent). 9. Vedder, 1918 (13.0 per cent). 10. Walker and Haller (12,000 routine tests, 12.0 per cent). 11. Walker, Baltimore (10.8 per cent). 12. Whitney, San Francisco (7.4 per cent). 13. Warthin (5.8 per cent). 14. Peterson, Ann Arbor (5.8 per cent). 17. Vedder (candidates for commissions, 5.0 per cent). (Varied from the chart presented by John N. Cruikshank in his article, "Maternal Syphilis as a Cause of Death of the Fœtus and of the Newborn Child," by omitting the figures of McIlroy and Watson.)

mother are varied to such an extent that the ordinary clinical manifestations of the second stage may be absent. In the "postconceptional" type of the disease the fetus is probably infected through the

placenta, for near the end of pregnancy, owing to hemorrhages and separation, there are breaks in the placental tissue barrier between the two blood streams. Manouelian and Cruikshank have recently shown that the placenta is free of the treponema in a large percentage of the cases, nevertheless this barrier is effective only when the organ is intact. Theoretically, there is still another method of infection: the inoculation of the infant during its passage through the birth canal.

Williams believes that direct infection of the ovum by the spermatozoön must be held *sub judice* for he argues that some spore or predecessor of the spirillum may be carried by the head of the spermatozoön. Such preceding form is not outside the bounds of possibility as is shown by the observations of Noguchi mentioned in the Harvey Lecture of 1910, and by A. Routh, in an article in the *Lancet* in 1918, who cite evidence of granular, spore-like, resting, non-flagellate forms of the spirochete. Therefore, although proof is now lacking, there may be direct paternal infection of the ovum at the time of conception. With the exception of Williams, modern writers, both obstetricians and pediatricians, have ignored this hypothesis.

If the infection comes directly from the mother there are several clinical facts that have awaited explanation for many years. In the first place many of these mothers (in some clinics as many as 85 per cent) show no signs of lues other than the positive reaction and yet their infants are infected. Colles in 1837 declared that the syphilitic infant could nurse its uninfected mother without conveying the disease to her. These mothers appeared to be immune and the proposition, known as Colles' law, was accepted until 1907 when the Wassermann test was first devised. It was then discovered that the women who had no symptoms had positive blood reactions. In the middle of the last century Profeta's law was enunciated to the effect that the syphilitic mother cannot infect her healthy newborn baby through nursing it; this law is the converse of Colles' law. The Wassermann reaction shows that these supposedly healthy infants are syphilitic.

Hereditary Syphilis.—The older writers believed that syphilis was transmitted to the third generation and they ascribed most of the dystrophies either to damage of the early embryo or to the embryo formed by the union of the damaged sperm or ovum. Edmond Fournier, the great syphilographer, in 1898 in his book on the stigmata of hereditary syphilis insisted that there were pathological changes that were not at all syphilitic in character and yet were due to this disease and resulted in arrests and imperfections leading to organic and osseous

malformations and monstrosities; or merely to inferiorities in construction or intellectual development. He included in this grouping such deformities as anencephalus, meningocele, cleft palate, spina bifida, cardiac anomalies, and scleroderma. Ballantyne calls these indirect results of syphilis "para-syphilitic" and objects to the word "hereditary" because the condition differs completely from the ordinary manifestations of syphilis—that is, the small-celled infiltration, thickening of the vessel walls and syphilomata. In a review of Fournier's work, Ballantyne writes that while there is no doubt that syphilis of the parents and malformations of the children are accidentally associated in some cases, the frequency of these coexistent anomalies of structure and syphilitic parentage is too great to deny the possible relationship of cause and effect.

The development of our knowledge of the abnormalities of the embryo, and especially the work of Mall, Stockard, and Bagg, has shown that interference with the vascular supply, the presence of poisons such as alcohol, or damage to the ovary by irradiation before mating may cause structural deformities and organ abnormalities. The action of the syphilitic toxin on the ovaries of the congenitally syphilitic woman may cause her to cast off defective ova through the entire period of her sexual life. The same thing may be said of the congenital male syphilitic who may pass deformed structures through defective and abnormal spermatozoa. We have no proof that the ova of syphilitic women are defective but recently we have obtained information concerning the spermatozoa of syphilitic men. V. Widakowich has studied the condition of the sperm in relation to the positive Wassermann reaction and in a group of 41 syphilitics he found in 8 cases 922 normal and 78 pathologic spermatozoa per 1,000; in the remaining 33 cases there were 949 normal and 51 pathologic per 1,000. In the examination of 16 healthy single individuals there were 981 normal and 19 pathologic per 1,000. In 5 cases of hereditary syphilis he found three cases with 68, 100, 117 pathologic spermatozoa per 1,000. These figures may be compared with those of two alcoholics who had 12 and 18 abnormal per 1,000 sperm. The abnormalities found were the following: two, three or four heads with one to four tails; giant and dwarf formation; anomalies in size and form of the head and anomalies in the pars intermedia and tail. These results should not be accepted offhand, but if controlled, it again brings forward the necessity of regulating the sexual relationships of the syphilitics who are supposedly cured.

It is quite possible that the production of abnormalities may be brought about through the action of the virus and the toxins in the father or the mother before mating, rather than in the grandparents.

PATHOLOGICAL MANIFESTATIONS

Placenta.—The infrequency with which the spirochetes are found in the placenta has already been mentioned and it is possible that the local phagocytosis that takes place in this organ is the explanation. The organism is much more readily found in the cord, although even here there is a round-celled infiltration about the vessels. It is a curious fact that the organism can be absent in the placenta when the viscera of the child swarm with spirilla.

It has long been thought that the macroscopical examination of the placenta in syphilis is diagnostic and it is only recently that Holland and Cruikshank have cast doubt on the pathognomonic value of this evidence. The syphilitic placenta is usually larger and heavier than the normal; it has a pale gray, greasy surface and the cotyledons are deep and loosely connected. Scattered throughout the organ are areas of fibrosis. Holland, in 34 positive syphilitic cases found that only 65 per cent of the placentæ were heavier than the normal and he attributed this extra weight to edema from maceration and autolysis. Holland belittles, also, the other signs enumerated. Urech of Basle, in the examination of a small number of syphilitic women found the placenta abnormally large in 70 per cent.

Laboratory evidence as to the condition of the placenta can be determined in four ways: (1) The lobule may be dissected and the villi teased out under water and instead of the normal fine arbor-like ends, the villi are large, opaque, and irregular with club-shaped ends. (2) Under the microscope with the section of the villi hardened and stained these findings are characteristic. The villi are large owing to the proliferation of the stroma and the vessels may be absent; the syncytial layer may proliferate also and invade the underlying tissues. (3) There is a round-celled infiltration about the vessels and cord. (4) Spirochetes may be discovered in the placenta or cord.

As regards the macroscopic and microscopic appearance of the placenta, Holland found that of 21 that gave a typical appearance of syphilis, 19 were undoubtedly syphilitic as proved by other evidence. The remaining two were cases of macerated fetuses in which there was no evidence of syphilis and the mothers were negative.

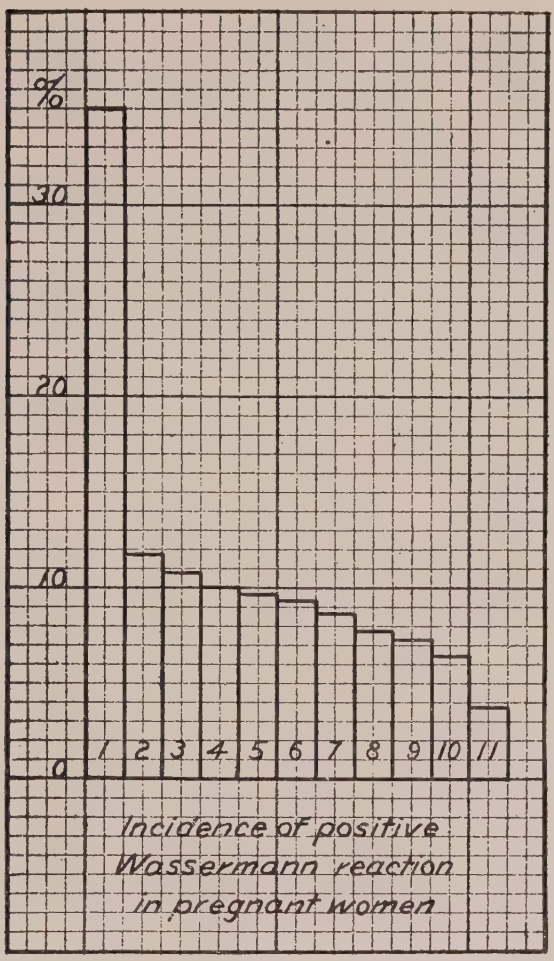


FIG. 18.—INCIDENCE OF POSITIVE WASSERMANN REACTION IN PREGNANT WOMEN. 1. McCord, Atlanta (2,500 colored women, 32-35 per cent). 2. Ottenberg, New York (2,488 cases, 11.5 per cent). 3. Falls and Moore, Chicago (116 cases, 10.6 per cent). 4. Connell and Stillians (hospital cases, 10.0 per cent). 5. Jeans (5,358 cases collected from other publications, 9.66 per cent). 6. Cruikshank, Glasgow (1,881 cases, 9.04 per cent). 7. Commiskey, Brooklyn (1,822 cases, 8.6 per cent). 8. Judd, Brooklyn (892 cases, 7.9 per cent). 9. Williams and Palmer, Philadelphia (40 cases, 7.5 per cent). 10. Adair (857 cases, 6.17 per cent). 11. Connell and Stillians (private cases, 3.6 per cent). (Varied from the chart presented by John N. Cruikshank in his article, "Maternal Syphilis as a Cause of Death of the Fœtus and of the Newborn Child," by adding the figures of McCord of Atlanta.)

Slemons in 360 consecutive deliveries found that the Wassermann reaction and the placental examination agreed in 95 per cent. When the villi, which are an outgrowth of the chorion and therefore pertain to the fetus, show these histological changes and the mother's Wassermann is positive, syphilis is present in both mother and child.

Bones and Cartilage.—For many years it has been thought that osteochondritis of the long bones in the newborn is diagnostic of syphilis and that it is universally present in the disease. Recent examinations and especially the work of Holland and his associate, Turn-

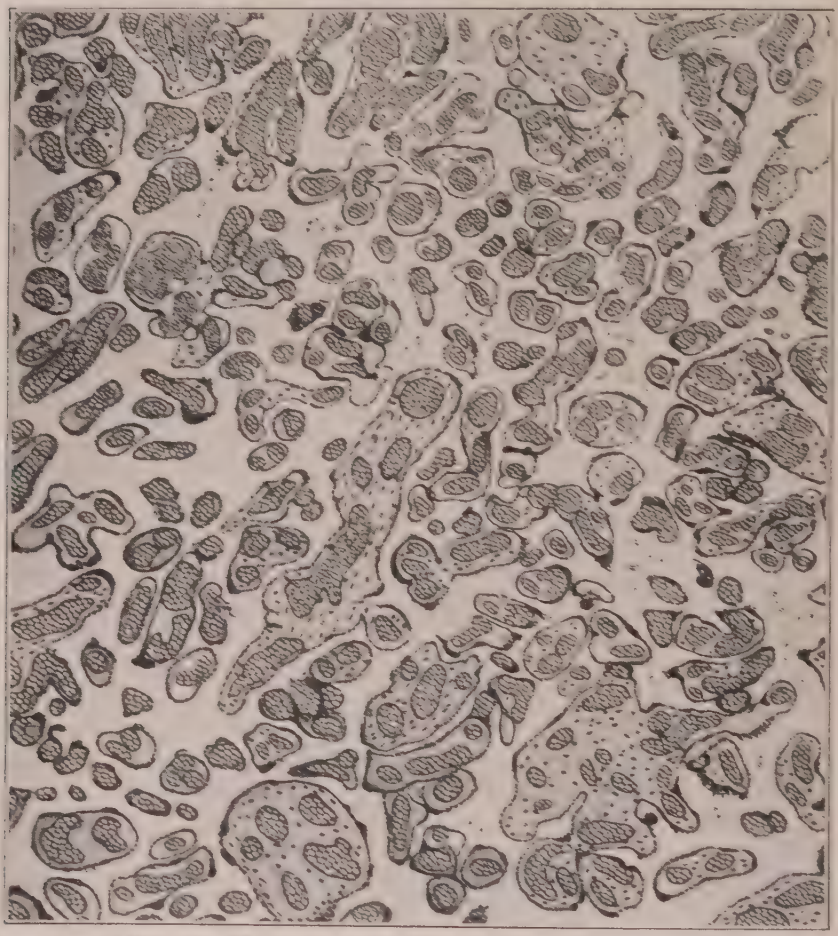


FIG. 10.—MICROSCOPIC SECTION OF NORMAL PLACENTA.
(Eardley Holland, *Report on the Causation of Fatal Death*, Ministry of Health, London)

bull, show that the condition was present in 97 per cent of their 37 cases. Osteochondritis at the epiphyseal junction results in the production of new and uncalcified bone that causes a disturbance of the normal linear appearance in this area. The provisional calcification that ensues, produces, when the bone is immersed in formalin, an unbroken yellow line which is pathognomonic. Turnbull believes that

in the early lesions the yellow zone of provisional calcification may be abnormally deep but with no other recognizable abnormality and that the junction of the epiphysis and diaphysis remains regular and unbroken. It is this type of case that renders diagnosis difficult or impossible unless spirochetes are discovered. Turnbull also states that the syphilitic osteochondritis at the epiphyseal junction results in an

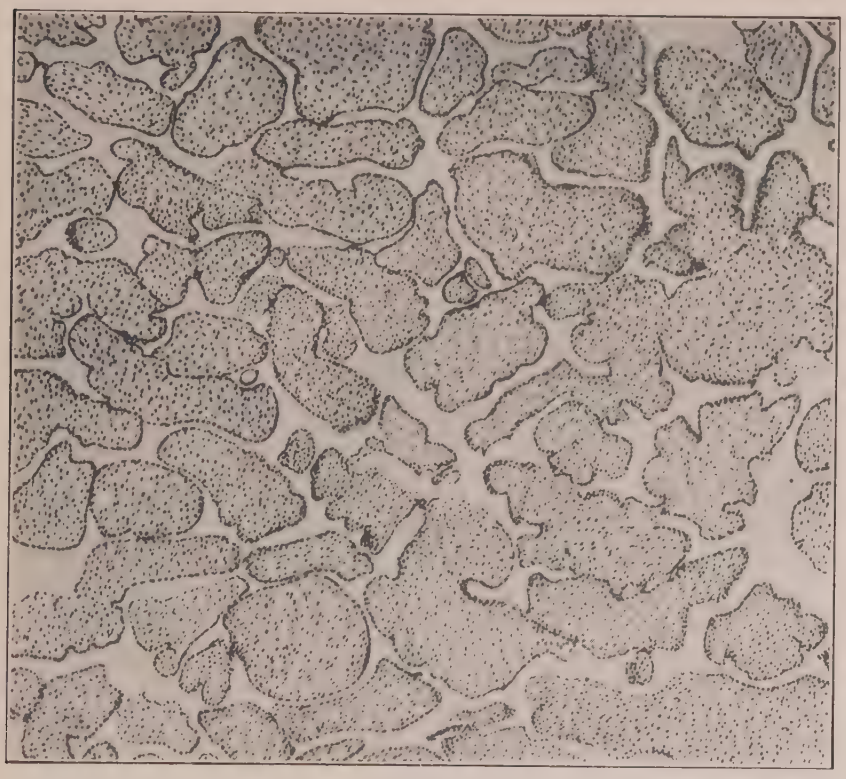


Fig. 20.—Microscopic Section of Syphilitic Placenta.
(Eardley Holland, *Report on the Causation of Fœtal Death,* Ministry of Health, London)

invasion of the provisional calcified cartilage by vessels and osteoclasts from the diaphysis and the production of a yellow zone unusually deep. The calcification may extend along the side of one or more vertical vessels thus rendering the calcification line shallow at such areas and the zone notched and irregular. The transverse chondral vessels are also filled with a line of calcification, and ossification may proceed toward the epiphysis from this transverse vascular arch. This gives a yellow, irregular line followed by a zone of red marrow

in which the osseous channels can be felt by the point of the scalpel.

Fibrosis occurs in all but the earliest lesions. It affects the marrow of the metaphysis or the canals in the cartilage or both and is of great assistance in the recognition of syphilitic osteochondritis. There are two conditions that simulate this lesion. The first is rickets in which there is an irregularity of the line of the junction between the

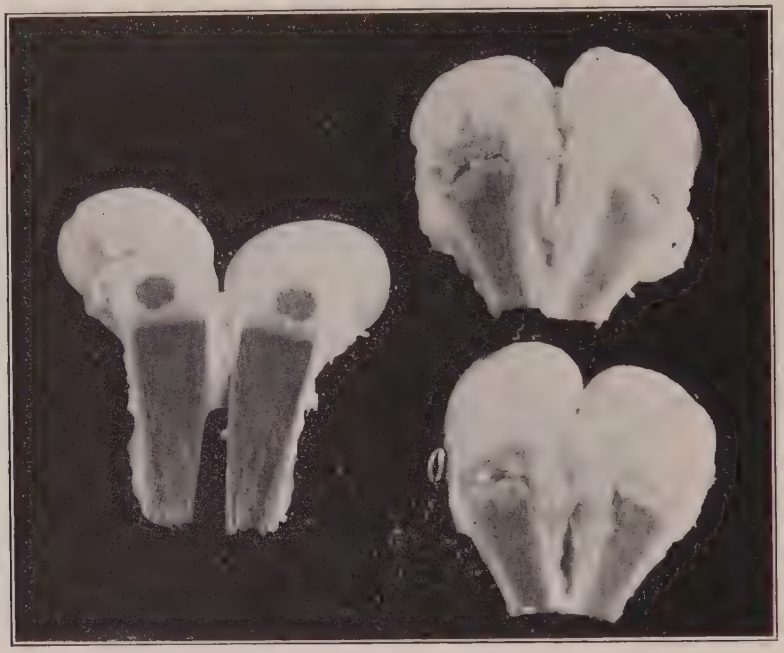


FIG. 21.—SPECIMEN OF NORMAL BONE AND, ON THE RIGHT, DISEASED BONE SHOWING NECROSIS AND IRREGULARITY AT THE EPIPHYSEAL LINE FROM CONGENITAL SYPHILIS.

(Specimens from J. R. Losee, Lying-In Hospital, New York)

epiphysis and the diaphysis, but the bone, owing to an absence of calcification, remains osteoid and soft. In syphilis any softened areas are focal and are filled with areas of granular tissue and fibrosis which are easily recognized.

The second condition, an exceedingly important one, concerns the changes that occur at this junction line in the bones of the macerated fetus. Edema at the line of junction causes a swelling and deepening of the line but there is not the irregularity that is common in syphilis. It must be remembered that in the early syphilitic lesions, irregularity of the bone has not occurred but appears later as the calcification

extends along the course of the vessels. Strachan pointed out this change in his examination of 24 macerated fetuses, only 6 of which proved to be syphilitic. Browne examined 22 macerated fetuses and found that 14 were syphilitic. Shipley, Pearson, Welch, and Greene examined with the x-ray 300 fetuses from six months of pregnancy to term and found bone changes that were either significant or suspicious in 46 cases. This method of examination is not effective in

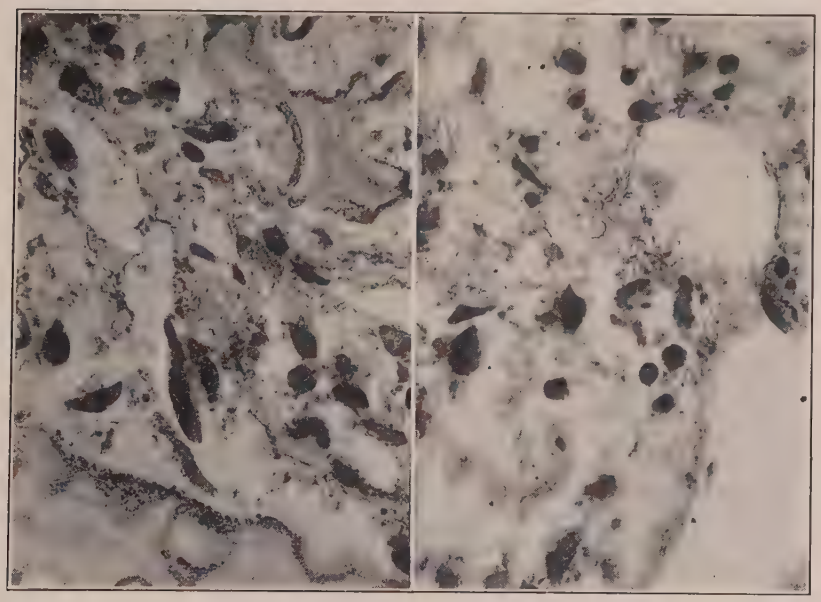


FIG. 22.—SYPHILIS AT EPIPHYSEAL JUNCTION OF FEMORA. SPIROCHETES SEEN IN THE DISEASED BONE.
(Specimen from J. R. Losee, Lying-In Hospital, New York)

discovering all the cases, yet the number determined is far below the average that might have been expected.

Osteitis and periostitis of the long bones in early childhood give rise to the production of the "saber tibia" often seen in the colored race.

Viscera.—The viscera of the syphilitics, especially the spleen and the liver are larger and heavier than the normal and the increased size and weight has been thought to be diagnostic of syphilis. Holland found that in 100 per cent of the spirochete-positive cases the liver was above the average in weight but in the series there were 14 macerated spirochete-negative cases that had exceptionally heavy livers. He adds, however, that of these 14, three were associated with positive

Wassermann reactions in the mother and one was classified clinically as "certain syphilis."

Histologically the liver shows a small amount of fibrosis with

FIG. 23.—SYPHILIS AT THE FEMUR WITH TYPICAL IRREGULARITIES AT THE EPIPHYSEAL JUNCTION (WEGNER'S LINE).
(Specimen from James Ewing, Cornell University Medical College)

edema in the tissues. Groups of hematopoietic cells are scattered throughout the organ and there are many liver cells that are not perfectly differentiated. There may be, also, gummatous areas, some-

times exceedingly small, scattered all over the liver. Stained by the Levaditi method the presence of the spirochete is usually shown. Cruikshank states that the fibrosis areas in the liver are not a constant finding as they appear in only 50 per cent of the spirochete-positive cases in his series. In the Wassermann positive nonmacerated cases definite fibrosis was present in 20 per cent but it was also present in 5 per cent of the Wassermann negative nonmacerated fetuses. He also states that the masses of hematopoietic cells are frequently absent from syphilitic cases and he believes that it is difficult or impossible to find histological changes that are constantly present in syphilis and absent in the nonsyphilitic.

Spleen.—Ninety-seven per cent of the syphilitic-positive cases in Holland's group had enlargement of the spleen and many had a general fibrosis as well, sometimes with minute gummata distributed throughout. Myoid areas with hyperplasia of the connective tissues are often present. The combination of a much enlarged and heavier liver and spleen has a high diagnostic value.

Skin.—Peeling of the skin in the macerated infant was formerly believed to be due to syphilis but we now know that it is two to three times more likely to be due to toxemia of the mother. Maceration that occurs in the palms of the hands and the soles of the feet in the living fetus is usually associated with syphilis. Rhagides or the splitting of the skin at the corners of the mouth and the anus is quite likely to be found in syphilitic infants. Skin lesions of the bullous type—the so-called syphilitic pemphigus occurring in the first month of life—are uncommon and even in the large city institutions are rarely seen. They are apt to be confused with exfoliative dermatitis of the newborn in which large areas of the skin peel off. Syphilitic eruptions of the character of ordinary skin lesions, that is, maculopapular, are rare in the neonatal period.

Mucous Membranes.—Chronic inflammation is frequently present in the nasal mucous membrane of the syphilitic infant and results in the condition known as the "snuffles." The passage of air over this inflamed area, which is often ulcerated in the form of the mucous patch, produces a curious noise that is appropriately described by the term. When it occurs within 24 hours of birth and continues it is diagnostic of syphilis. During the first few hours of a child's life fluid in the respiratory passages may simulate the "snuffles," but drainage by placing the body of the child higher than its head brings prompt relief.

Teeth, Eyes and Ears.—Manifestations of congenital syphilis may appear in the teeth, ears and eyes. In the condition known as Hutchinson's teeth there is, owing to the lack of normal calcification and enamel production, a notching of the incisors at the center of the cutting edge: this defect becomes evident in the second set of teeth. There may be bone deterioration in the ear that leads to chronic osteitis and deafness. The ocular condition of keratitis is most common and usually occurs before the age of puberty.

MATERNAL SYPHILIS

Symptomatology.—From the standpoint of prenatal care the mother's condition is, primarily, to be considered. We have already pointed out that 85 per cent of the pregnant women with syphilis show no signs of the disease and give no history of infection, therefore we are, for that percentage, dependent upon the presence or absence of the Wassermann reaction. Three-plus or four-plus Wassermann reaction is ordinarily thought to be diagnostic of syphilis and in 97 per cent of the cases it is probably correct. The question arises whether or not the mother and child should receive treatment on the basis of this blood reaction alone. In certain unusual conditions the reaction may be positive in the absence of syphilis and in the toxemias of pregnancy it may be positive. There is also the possibility that the uterine contractions at the time of labor may cause the presence of substances in the maternal blood stream that will give a positive reaction. We know that retroplacental blood is occasionally Wassermann positive. It has been previously mentioned in this chapter that pregnancy changes the activity of the spirochete so that the secondary lesions of syphilis in pregnancy may be absent and the tertiary lesions develop early or, according to Williams, there may even be a tendency toward spontaneous cure of the disease. Moore of Williams' clinic claims that in one-half of the cases infected during the course of pregnancy, the secondary symptoms were much milder than usual and that the protection against these lesions may endure for a long period, possibly a lifetime. In a study of 178 pregnant women and 22 non-pregnant women with positive Wassermann reactions this observer shows that 44, or 22 per cent, had outspoken lesions of early or late syphilis at the time seen. Of the remainder, in 72 per cent, the diagnosis was confirmed by the past history, physical examinations, response to treatment, the subsequent course of the disease, or by a combination

of all these factors. There were only 21.5 per cent in which all evidence of syphilis except a positive blood Wassermann was lacking.

In view of the frequency of this disease, the necessity for obtaining a Wassermann reaction on all pregnant women is evident. Cruikshank presents two charts showing the incidence of syphilis. The first chart indicates the percentage of positive Wassermann reactions in adults. We have varied the chart somewhat by omitting the first two percentages which were based on a very small number of cases (Fig. 17). The general prevalence of syphilis is so great that it is reasonable to suppose that a correspondingly high figure is to be found in pregnant women. We have added to his second chart McCord's figures which show a 35 per cent incidence in 2,500 pregnant colored women. (Fig. 18.)

Race and environment are important factors in determining the frequency of the disease. In Baltimore, Williams found positive Wassermann reactions in 16.29 per cent of the colored women as against 2.48 per cent in the white women, a rate that gives a positive test for every 6 colored women as compared with every 40 white women. Welz and Van Nest, in 1,467 cases attending a prenatal clinic in Detroit, found 5.7 per cent of the white women and 19.3 per cent of the colored women had positive reactions. In some cities and in some clinics the rate is lower. In Boston, Hinton found positive Wassermann reactions in 4.18 per cent of 10,427 cases or, if we included the doubtful cases, a total incidence of 8.3 per cent. Gynecological and urological clinics and social service organizations operating in densely settled regions reduce the number in both males and females through education and by the treatment of active syphilis.

There are a number of interesting observations in regard to the infants delivered by mothers with a positive Wassermann reaction. Williams found that of 169 untreated women with positive reactions there were only 48.5 per cent who had syphilitic children. Harmon, (quoted by Creadick) collected the histories of 150 syphilitic women with a total of 1,001 pregnancies and the result of these gestations were 172 stillbirths and miscarriages, 229 infant deaths, and 600 babies born alive of which 390 were diseased, or finally 210 healthy children or approximately 20 per cent. In a group for comparison of 150 nonsyphilitic women with 1,000 pregnancies there were 94 stillbirths and miscarriages, 114 infant deaths, and 792, or 79 per cent healthy and living children. Boas and Gammeltoft found that in 158 pregnant syphilitic women who were untreated, only one baby was born without

syphilis; this is undoubtedly the most unfavorable report. It is possible that these figures have been influenced by the fact that in many clinics the newborn are considered syphilitic if the cord Wassermann reaction is positive. While there may be some doubt as to whether the positive serum reaction in pregnancy is sufficient indication for treatment of the mother there is no doubt that a positive cord reaction is not sufficient either for diagnosis or as an indication for treatment of the newborn. Esch suggests that the positive reaction in an infant may be due to alteration in lypoid metabolism or to the intermingling of maternal and fetal blood following the separation of the placenta. Williams found that a positive reaction at birth would not necessarily remain positive and conversely a negative reaction might later become positive. Thomsen and Boas found that in 88 newborn syphilitics the Wassermann reaction was positive in 35.22 per cent. Of the remaining 65 per cent in this group, during a period of observation covering three months, only 6.3 per cent developed symptoms of syphilis or had a positive Wassermann reaction or died with syphilitic disease of the viscera. In nearly all the obstetrical services in New York the cord Wassermann is held as inconclusive evidence of the disease and the routine has been discontinued. However, in 1,000 cases of Cruikshank's there was an agreement at birth between the mother's blood and the child's in 94.9 per cent and, of course, if there is a positive Wassermann reaction from the cord blood and also macroscopic and microscopic evidence of syphilis in the placenta, the child may be declared syphilitic and the treatment begun at an early period. We have a valuable test for congenital syphilis that can be conducted on a living child; this is the x-ray observation of the so-called Wegner's line or the line of junction of the epiphysis and diaphysis of the long bones.

THE RESULTS OF SYPHILIS

Abortions and Miscarriages.—There seems to be little tendency for the disease to produce abortion in the first three months of pregnancy and the only figure that is at all high is that of Eden who, in 1919, estimated that 16 per cent of the pregnancies so terminated. In the same year Adair, in a series of 1,095 women, found that 31.8 per cent of the pregnancies in the Wassermann positive cases ended in abortion and 30.6 per cent of the pregnancies in the negative reaction cases terminated in the same manner. In 1,000 cases examined

by Cruikshank there were 128 abortions and only 6 of these women had positive Wassermann reactions, although there was a total in the group of 94 positive women. Cosbie of Toronto found that in 11 syphilitic women with a total of 44 pregnancies there were 15 abortions or 34 per cent. He controlled these observations by quoting the figures for 280 nonsyphilitic women with 1,203 pregnancies in which there were 527 abortions or 43 per cent. No other statistics show the abortion rate as high as this. It would seem from a theoretical standpoint that the presence of round-celled inflammation in the decidua or in the forming placenta would interfere with the proper blood supply and lead to abortion. However, from the papers quoted above it appears that there is no great difference in the proportion of early miscarriages in the infected and noninfected cases, or at most no evidence that syphilis has any influence in increasing the number of abortions.

Premature Labor and Stillbirth.—In the absence of evidence of toxemia or abnormal situation of the placenta, obstetricians generally attribute to syphilis the interruption of pregnancies that occur from the twenty-eighth to the thirty-sixth week. In 334 premature labors, Williams found that syphilis was a factor in 40 per cent. Van Nest in 485 cases found that syphilis was the cause in 42.7 per cent. In 1,000 cases, Cruikshank found premature birth in 19 per cent of the mothers with negative Wassermann reactions, and in 32 per cent of those with positive reactions and in these premature syphilitic births, 68 per cent were stillborn as against 34 per cent in the nonsyphilitic group. Adair in a series of 857 women estimated that syphilis was present in 6.2 per cent. Thirty per cent of the mothers of premature infants and 10 per cent of the mothers of stillborn infants had the disease.

Neonatal Deaths.—The death-rate from syphilis during the neonatal period is low. In Cruikshank's group, during the first two weeks of life the death-rate was 11.7 per cent for the infants of syphilitic women and 9.5 per cent for the children of the nonsyphilitic. In the second two weeks, in the infected group, 9.6 per cent died as against 6.5 per cent in the Wassermann negative group. During the second and third months 3.84 per cent died in the positive and 3.04 per cent in the negative group. From this time on the death-rate in the syphilitic group was marked. In the positive group during the fourth, fifth, and sixth months there were 3.6 per cent of deaths as compared with 0.8 per cent in the negative group. From the seventh to the twelfth

month the percentage was 0.8 in the positive group and 1.3 in the negative. From the thirteenth to the seventeenth months the positive group rate was 0.8 per cent and the negative 0.9 per cent. It is evident that throughout the first six months of life there is a higher death-rate in the syphilitic than in the nonsyphilitic.

TREATMENT

During Pregnancy.—The treatment is started as soon as a diagnosis is made. The cases are discovered to be Wassermann-positive through routine work, and as mentioned above, in not more than 15 or 20 per cent of the cases are there any symptoms of the disease.

From time to time there has been much discussion as to the advisability of giving arsphenamin or mercury during the first three months of pregnancy. In this period the pregnancy cases have a relative insufficiency of the liver which is often accompanied by morning vomiting of pregnancy or by pernicious vomiting. In the cases that succumb to toxemia, the liver cells have been found degenerated in the neighborhood of the center of the lobules and the question arises whether the arsenic preparations might not produce a similar liver disturbance that would culminate in acute yellow atrophy and death. One such case occurred on my service. On the other hand acute yellow atrophy occurs in nonpregnant women and in males and the knowledge that thousands of cases have been given arsphenamin or mercury injections in the early part of gestation with only one or two subsequent deaths leads one to conclude that the procedure is relatively safe provided that no marked signs of toxemia exist. The treatment should be continued through the remainder of the pregnancy and up to the time of labor. It is our belief that it is never too late to start the injections and even if only one or two can be given before the delivery, they are of value.

The following method is the most efficient way to administer the drugs: A series of one-half dozen arsphenamin injections averaging 0.6 grams each is given. In arranging the dosage it is better to divide the first dose, giving 0.2 grams for the first injection and 0.4 grams two days later. Thereafter one injection is given weekly. After the arsphenamin follows a series of intramuscular injections of one grain of the salicylate of mercury with a total of six injections, the time spaced as with the arsphenamin. As soon as both series are complete the course is started over again so that three complete

series may be administered during pregnancy. Generally a complete treatment cannot be planned as the patient comes to us, not after the first missed menstrual period but considerably later and often not until the sixth or seventh month. It is well to mention the fact, sometimes forgotten, that this treatment must be kept up with appropriate intervals and variations through three years. From the child's point of view it is necessary that the mother's treatment be continued as the danger of reinfection is present if her cure is not accomplished. The male member of the family is a menace to those already under treatment and therefore he should be under efficient medication and control.

If a child is born apparently normal and without luetic manifestations should it be given the treatment? The child through its placental circulation has had imperfect medication for congenital syphilis. The Wassermann test is of no aid at this period, or as a matter of fact, until several months of infancy have elapsed and therefore this test is not a perfect control. During the first two weeks of life the child is having a struggle for existence and is running a mortality risk of 4 to 5 per cent and, in the absence of symptoms, the possibility of deleterious effects from the action of mercury and arsenic must be considered. In most maternity institutions the child receives no treatment but on discharge is directed to the pediatric clinic.

Results.—From Scandinavian countries, H. Boas and S. A. Gammeltoft reported 111 patients who received mercury during pregnancy and only 31 gave birth to normal children. In another group of 79 cases that received salvarsan there were 60 healthy children. Of 26 patients who had salvarsan and mercury during pregnancy there were 19 normal children. Six or seven women receiving the treatment before and during pregnancy had normal babies.

John Adams in England, treated 113 mothers during their pregnancies and had but 8 stillbirths. Thirty-one babies were born with positive Wassermann reactions and 4 of these died; a total mortality of only 10.6 per cent or about 3 to 5 per cent above the ordinary rate.

Vignes and Galliott presented a table of their results in the treatment of syphilis at the Paris clinic:

Extent of Treatment	Number of Mothers	Children Living	Children Dead
Before and during pregnancy	21	21	0
During pregnancy	29	27	2
Partial, during pregnancy	16	9	7
No treatment	53	20	33

In this country there are three important papers citing the effect of treatment of pregnant and luetic women. In a preliminary report Beck states the results in 32 women. In the first group there were 4 cases that received no arsphenamin; one child was born alive with no evidence of syphilis and 3 were born living with congenital syphilis. In the second group there were 11 cases that had from two to three injections of the drug, and there were 5 children without syphilis, 3 living with congenital syphilis and 3 were stillborn. In the third group there were 17 women who had five or more injections, with 14 living children with no evidence of syphilis, one child alive with congenital syphilis and two stillborn without the disease. He concludes that it is safe to give arsphenamin at any stage in the pregnancy.

Welz and Van Nest took care of 147 syphilitic mothers in the Department of Health Clinic in Detroit. Forty-six had treatment consisting of three or more injections of neo-arsphenamin and eight or more injections of mercury and these women gave birth to 45 living children with one stillbirth or a fetal mortality rate of 2.1 per cent. The remaining 101 cases had no treatment or insufficient treatment and these women had 26 miscarriages or stillbirths giving a fetal mortality of 25.7 per cent. As an outcome of the treatment of these cases it is interesting to note that in 26 mothers who had full treatment the babies' Wassermann reactions were positive in 18, or 70 per cent, and at the same time in 53 mothers receiving insufficient treatment or no treatment there were positive cord reactions in 85 per cent.

Williams had 157 patients with no treatment and in this group 52 per cent of the children were stillborn or presented some evidence of the disease. In a second group of 103 cases that received insufficient injections, that is, only two or three of arsphenamin and no further treatment, there were 37 per cent of the children stillborn or born showing signs of syphilis. One hundred and sixty-three patients received satisfactory treatment, that is, 4 to 6 injections of arsphenamin with a course of mercury, with the result that the Wassermann reaction became negative and remained so. Because 7.4 per cent of the children showed evidence of syphilis or were stillborn he states that "there is every reason to hope that in the future syphilis may be practically eradicated as a cause of fetal death in all properly conducted clinics in which the women register prior to the middle of the pregnancy."

Congenital Syphilis.—The treatment of children with congenital syphilis should be conducted along the same line as is that of adults, with mercury and arsphenamin but in smaller doses. It is sometimes better to give such young children neo-salvarsan because it is less toxic. The dosage is approximately 0.1 gram of neo-arsphenamin, given week by week until six injections have been given. Mercury should be administered, preferably by injection. The older and now inadvisable form of treatment was by mercury inunction and the method commonly used was the application of blue ointment to the inside of the diaper or a small amount of the ointment was rubbed on the inside of the arms, legs, and chest of the child. Von Reuss mentions that his favorite method of treatment is to administer by mouth yellow iodid of mercury three times a day in doses of one-half to one milligram. He states that inunction is not suitable for the newborn because of the delicacy of a baby's skin.

Jeans gives 0.03 grams of mercuric chlorid per kilogram of body weight by intramuscular injection once a week and 13 milligrams of mercury in chalk by mouth three times a day and in addition, every two months 0.01 gram arsphenamin per kilogram of body weight preceded by a spinal puncture to avoid Herxheimer's reaction. Fordyce and Rosen administer to a child three weeks to six months of age 0.1 gram neo-arsphenamin by intramuscular injection for eight weeks and then follows with 10 to 12 intramuscular injections of 0.1 grain bichloridal (mercuric chlorid). Two full courses are given with possibly a third course if it is necessary, in order to maintain a negative serum reaction.

Results.—The congenital syphilitic infant may be placed in one of three groups: (1) The symptom-free and Wassermann-negative infant who may or may not show symptoms later in life. No treatment should be given unless the Wassermann test becomes positive. The test should be made every three months for the first two years and then twice a year. (2) The symptom-free but Wassermann-positive case. This type responds readily to treatment and with little effect on the general health. (3) The infant with active syphilis and a positive Wassermann. These children have a poor outlook for they are often premature and underdeveloped as well as diseased. Fordyce and Rosen present the only systematic study that has been made of these congenitally diseased infants and their results open the way for the saving of thousands of lives. Of 128 patients with congenital syphilis treated by them 55 received two or more courses of neo-arsphenamin and

mercury and 30 of these or 53 per cent became negative both as regards clinical evidence and serum reaction. Of the remainder 22 or 30 per cent became negative with less than two courses and the others remained positive, but they were older children who had received the treatment with less regularity.

CONCLUSION

It is apparent from the study of this subject that a considerable number of infants are stillborn or die in the early months of life or grow up diseased as a result of syphilis in one or both parents. With proper antenatal care of the mothers and early treatment of the congenitally syphilitic infants these deaths and the morbidity of those surviving may be eliminated to a large extent. Attempts at reduction of the stillbirth and neonatal death-rate should center in the treatment of this disease in the prenatal period, for the field has been neglected owing to the absence of secondary symptoms in the mother and the difficulties of accurate diagnosis.

BIBLIOGRAPHY

Adair, F. L. Am. J. Obst. & Gynec., 1918, 678.
Adams, John. Brit. M. J., 1922, No. 3185, 56.
Bailey, H. Consideration of the Causes of Stillbirths and Neonatal Deaths, Arch. Pediat., April, 1923.
Beck, A. C. Am. J. Obst. & Gynec., 1921, 2: No. 40.
Boas, H., and Gammeltoft, S. A. Acta Gynec. Scand., 1922, 1: 309.
Browne, F. J. Edinb. M. J., 1921, 27: 153.
Cosbie, W. G. Am. J. Obst. & Gynec., 1922, 4: 40.
Creadick, A. N. Am. J. Obst. & Gynec., 1921, 2: No. 4, 4.
Cruickshank, J. N. Maternal Syphilis as a Cause of Death of the Fœtus and of the Newborn Child, Medical Research Council, London, 1924.
Fordyce, J. A., and Rosen, Isadore. Arch. Dermat. & Syph., 1924, 9: 355.
Holland, Eardley. Report on Public Health and Medical Subjects, No. 7, Ministry of Health, London, 1922, p. 5.
Jeans, P. C. J. Am. M. Ass., 1921, 76: 167.
Moore, J. E. Johns Hopkins Hosp. Bull., 1923, 34: 385.
Shipley, Pearson, Welch and Greene. Johns Hopkins Hosp. Bull., 1921, 32: 75.
Slemons, J. M. Tr. Am. Gynec. Soc., 1916.
Strachan, G. I. Brit. M. J., 1922, 2: 80.
Vignes, H., and Galliott, A. Progrès méd., 1923, 38: 1.
Welz, W. E., and Van Nest, A. E. Am. J. Obst. & Gynec., 1922, 4: 174.

WIDAKOWICH, V. Concerning Spermatozoa of Syphilitic Individuals, Semana méd., Buenos Aires, 1920, 27: 663.
WILLIAMS, J. W. The Significance of Syphilis in Prenatal Care and in the Causation of Fetal Death, Johns Hopkins Hosp. Bull., 1920.

CHAPTER IV

INFECTIONS DURING LABOR AND IN THE PUERPERAL PERIOD

At the present time puerperal infection is the cause of one-third of the maternal deaths. Long before the days of hand disinfection it was well known that fever in the puerperal period was infectious and as early as 1773 Charles White of Manchester, published a treatise on the care and management of pregnant and lying-in women in which emphasis was placed on cleanliness, free circulation of air in the lying-in room and the segregation of those developing fever. At that time it was realized that contagion was carried by the doctor either from other infectious diseases like scarlet fever and erysipelas, or from the autopsy room. In 1795, Gordon of Aberdeen noted the infectiousness of the condition and stated that he regretted to acknowledge that in the epidemic, which he had described, he had been the means of carrying it to a number of women. Blackman of Edinburgh in 1845 claimed that puerperal fever was carried to the patient by infectious material under the finger nails of the doctor. In 1843, Oliver Wendell Holmes cited the case of a doctor who died of septicemia acquired at a postmortem examination, and before his death he had attended several women in labor, who also died of septicemia. In his article on the contagiousness of puerperal fever Holmes pointed out that the infection was carried from the postmortem room or from the cases of erysipelas. In 1845, Semmelweiss in the Vienna Lying-In Hospital succeeded in reducing the sepsis mortality from 11.4 per cent to 1.2 per cent by requiring the students and the doctors to cleanse the finger nails and wash their hands, using a chlorid of lime solution. His theory, that decomposed animal matter carried to the parturient tract was responsible for infection, preceded our knowledge of bacteria and actually indicated the way to modern theories of asepsis. Negligence and carelessness in the aseptic preparations at the time of labor are the cause, in part, of the high mortality rate to-day. However, Charles White and Semmelweiss clearly stated that there were cases of infection in which the infectious material developed from decomposing lochia, and were,

therefore, auto-infections from the woman's vaginal or genital tract. We now know that bacteria which are nonvirulent to the woman, as they grow in the upper part of the uninjured vagina, may become virulent when they invade wounds of the cervix or the area in the uterus to which the placenta was attached. There have been groups of patients who have become septic following spontaneous delivery conducted under aseptic conditions and without rectal or vaginal examinations.

At least 50 per cent of the septic cases follow some obstetrical manipulation or operative delivery. The remainder arise from vaginal examinations by the accoucheur; from unsterile dressings or the failure by doctor or nurse to maintain an aseptic technic; or, occasionally, from auto-infection by bacteria existing in the vaginal tract.

Bacteriology.—The streptococcus is the most common form of infective organism. Pasteur discovered this organism in 1879 and was able to cultivate it from cases dying of puerperal sepsis. His findings were immediately controlled and accepted by others. It was found that various groups of the organism existed and they were given appropriate names such as streptococcus pyogenes and streptococcus mucosus. In the early part of this century it was learned that certain of these organisms had hemolytic effects and for clinical purposes and general grouping, the terms streptococcus hemolyticus and streptococcus nonhemolyticus were adopted. More recently Dochez, Huntoon, and others have separated the organism into groups according to serological classification or disease source. As the infection may be due to any one of the strains, it is exceedingly important for the purpose of control and treatment to ascertain the one involved. For serum preparation a combination of all the strains may be necessary.

The streptococcus is universally present and therefore it is constantly harbored in the vulva and vaginal tract, but there has been some controversy as to whether or not, when found in the latter location in normal individuals, it is capable of producing virulent infection and also whether it exists at all in the upper part of the vagina.

The staphylococcus is another organism which is commonly present and often leads to severe infection. These bacteria are pus producers and the staphylococcus aureus is the one that is usually involved in puerperal infections. Staphylococcus infection of the uterus is apt to remain local and therefore gives a better prognosis than does the

streptococcus, but if it is mixed with the streptococcus or colon bacillus the combined infection gives a grave prognosis.

The colon bacillus exists so generally in the neighborhood of the vulval entrance that ordinary examinations are likely to carry it within the vagina and as the labor progresses toward the end of the second stage the advancing head presses the feces from the dilated anus and fouls the lower part of what should be a sterile field. Not infrequently this bacillus is found in the urinary tract so that its presence in the wounds of the vulva or vagina is not unusual. When the colon bacillus infects the uterus in pure culture it produces a foul-smelling lochia with possibly a gas production. These infections are not, as a rule, fatal.

During pregnancy the gonococcus may be actively growing in the urethal and vaginal glands but it produces a virulent infection in the postpartum period only when the tubes are involved. If the tubes are injured by the contractions of the uterus at the time of labor or by manipulation involved in expressing the placenta, pus exudes into the pelvic cavity and results in peritonitis which may or may not be localized in the pelvis. It has been estimated that from one-tenth to one-sixth of all rises of temperature during the puerperium are due to this type of infection and nearly all writers give it a high frequency rate, but I believe that the incidence is overstated. The course of this infection is usually favorable.

There are several other putrefactive organisms which cause endometritis and a condition known as sapremia due to absorption of products of decomposition. Generally in the cases with fever other bacteria such as the staphylococcus are involved. These saprophytic bacteria produce gas and frothy, foul-smelling lochia.

Pathology.—The areas of infection may be limited to the vulva and vagina. Infections in this region usually occur in lacerations and produce what was formerly called the puerperal ulcer; infective organisms almost always include the colon bacillus and the staphylococcus. The site of the ulcer may become the seat of a grayish, firmly fixed membrane not unlike the diphtheritic membrane that appears in the throat. Usually these local ulcerations granulate and healing takes place. However, the infection may extend to the blood stream resulting in septicemia, or there may be extension to the lymphatics with a localized abscess. If these abscesses extend below the pelvic fascia drainage is readily secured. When the extension is from the upper part of the vagina the cellulitis reaches

the parametric tissue or through the venous channels. Prophylaxis in relation to lacerations and the manner in which they are repaired is the principle most to be emphasized.

In the conduct of normal labor one views the advancing or retarding of the descending head and the natural process is a slow and gradual dilation of the parts. In forceps extraction, in order to avoid tears, the slow dilation should be kept in mind. It is important to remember that forceps applied to the sides of the head add to the diameter that must pass through the pelvis. Many of the tears in the upper part of the vagina are due to dragging the head through an imperfectly dilated cervix; the cervix ring ruptures and the tears extend into the vaginal vault. Deep tears may also occur through the elevation of the forceps around the pubic arch in the process of extending the head. In this procedure the blade of the forceps, especially the long forceps, impinges and acts like a cutting instrument on the overstretched posterior vaginal wall. If tears occur they should be cared for with the same technic as is used in a secondary repair; in other words the condition requires a surgical procedure. Attempts to repair lacerations are often made with the woman in an improper position and without aid and light. The old-fashioned through and through sutures should be abandoned. Muscle layers must be brought into approximation and the mucous membrane layers separately repaired.

The modern conception of the puerperal uterus is that of a wound. The placental site is an area containing many vessel openings and offers an ideal location for the growth of bacteria. The cervix is often torn and from such portals infection is more apt to travel through the lymphatics to the parametric tissue, with pelvic cellulitis as a result. Where tears occur above the internal os, the infection may reach the peritoneal cavity causing a localized or general peritonitis. Under the placental site the veins may become infected and thrombosed and the thrombosis may extend to the larger vein trunks. Inflammation of the decidual lining of the uterus is likely to involve the muscle wall and an endometritis must always be considered as possibly complicated by such an extension. To the naked eye the appearance of the lining of the uterus infected by a pure streptococcus inflammation, is very little changed and in the microscopic examination the limiting wall of leukocytes is seen penetrating into the muscle. With colon bacillus infection and the saprophytic infections there is likely to be a foul sloughing decidua with discharge. It has only recently been recognized that the leukocytic barrier that limits these infections must not be

broken down. Any intra-uterine manipulation that breaks through the wall of leukocytes may end in septicemia and therefore the treatment should be conducted without manipulation or irrigation and even in obtaining specimens for bacteriological examination the greatest gentleness must be observed. These principles also apply to the septic uterus following abortion in the early months of pregnancy.

Frequency.—Puerperal infections are much more frequent than is commonly believed if a certain minimum temperature standard—100.04° F. for 24 hours—is recognized as an indication of infection. In 1919 and 1920 at the Rotunda Hospital, where a temperature of 100° Fahrenheit between the second and eighth day was accepted as determining the condition, there was a total morbidity of 6.9 per cent and in the years 1921 and 1922 the morbidity was 6 per cent. For the indoor cases in the Long Island College Hospital, Polak notes 9.3 per cent morbidity with a temperature of 100.8° persisting for 24 hours as the point of determination. In a recent group of 5,000 cases, attended by the senior students of that college, in which no vaginal examinations were made, the total morbidity was less than 3 per cent. However, it is but fair to state that morbidity in the outdoor deliveries is always less than in the hospital cases. Eno reviewed 7,000 cases in 1923 and found a total morbidity of 2 per cent in the outdoor cases and of 8.6 per cent in the hospital and there was a percentage of 22.9 for cases with operative procedure in the hospital as against 8 per cent in the outdoor patients.

The incidence of these infections is high but the mortality is very low. In England and Wales the rate of deaths per 1,000 from puerperal sepsis varied in the last quarter of the century from 2.1 to 1.3, and from 1908 to 1912 it was as low as 1.4 per thousand. In 1917 the rate in this country was 2.7 as opposed to 1.3 for England. In New York State, Eichel has shown that during the 5-year period 1916 to 1920 the rate was 2.02 per thousand outside of New York City and 1.35 per thousand for the city. His review showed that 40 per cent of the deaths from sepsis followed operative delivery. The difference in the city rate and that for the state at large is explained by the fact that in the city there are greater facilities for expert care. Another point worthy of note is that in rural communities the mortality rate from sepsis is not as high as in the small villages and cities over 2,500.

It is problematical whether the low rate in England and Wales and in New York City—that is 13 deaths per 10,000—will ever be materi-

ally reduced for the reason that there are certain predisposing causes that will surely present themselves in a large group of cases.

Predisposing Causes.—*Hemorrhage.*—The average loss of blood in normal deliveries is about 400 cubic centimeters but even in normal labor this amount may be doubled or trebled. With complications such as placenta prævia or accidental hemorrhage the patient may be exsanguinated either before or at the time of delivery. Furthermore, many of these conditions require operative delivery which, if done from below, is almost invariably attended by lacerations of the cervix or lower uterine segment, since the dilatation is artificial and incomplete. The first and second stages of labor may be uneventful, but in the third stage there may be an unusual loss of blood if the placenta does not separate normally. Under such circumstances, if it cannot be expressed by the Credé method, it is necessary to manually remove it and the hand of the operator after passing through the cervix comes in contact with the open vessels of the placental site. Infections in such cases are frequent, for with the shock and the depression due to the blood loss, resistance is lessened and there is also a direct loss of immunizing substances.

Prolonged and Difficult Labor.—When labor lasts more than 24 hours the patient becomes more or less exhausted and secondary inertia develops. The muscle fibers of the uterus and also of the abdominal wall have used all the nutriment available and the contractions are so frequent that little time for rest intervenes, therefore a period of muscular inactivity ensues and remains for an indefinite time. When the muscles have accumulated the contractile substances again, their power returns, but never with the original vigor. The hours of labor preceding the inertia have produced partial or complete dilatation of the cervix and there is usually rupture of the membranes. The uterus is, therefore, wide open to the assault of bacteria in the upper part of the vagina. Inertia developing as here described is often an indication for operative delivery. The edematous and compressed tissue of the cervix is further traumatized by the operative manipulations so that its resistance to infection is reduced to a minimum; and in addition the body as a whole is injured by the acidosis from the anesthesia. Without exception these cases have a rise in temperature during the puerperal period denoting a local infection which in certain instances develops into a general septicemia.

Toxemia.—It is a well-known fact that individuals with damaged kidneys succumb to an infection that would, under ordinary circum-

stances, do but little harm. In a similar way, when the kidney and also the liver have been damaged by the toxemia peculiar to pregnancy, any infection that occurs is likely to be more virulent. Severe toxic conditions usually necessitate emptying the uterus, and induced and forced labor lead to increased opportunities for bacterial growth. Figures have been presented to show that the incidence of sepsis after eclampsia is as high as 25 per cent. Eden, in the English statistics, found that in severe cases of eclampsia, cesarean section carried a death-rate of 46.3 per cent. One explanation of such a high rate is the increased deaths from virulent infections.

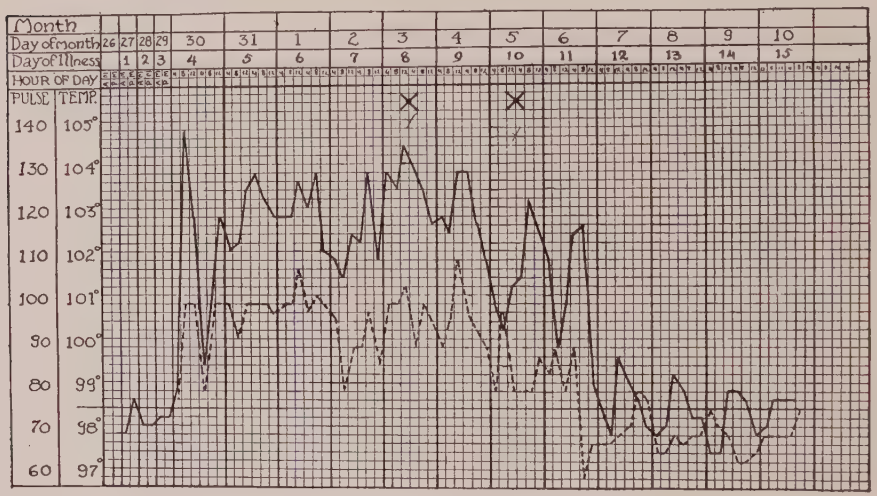


Fig. 24.—Puerperal Sepsis.

Bellevue Hospital School for Midwives, March 26, 1922. Para i. Spontaneous delivery. Blood culture sterile. Developed a right parametritis. Total of 150 cubic centimeters of polyvalent antistreptococcus serum given at the points indicated. (Reprinted from the *American Journal of Obstetrics and Gynecology*, June, 1924.)

Incomplete Emptying of the Uterus.—It is probable that by the fifth day postpartum every uterus contains bacteria. If the placenta has not come away intact, or if extra lobules have remained behind, or if large pieces of the chorion remain attached to the wall, there is an ideal cultural site for the growth of saprophytic or other organisms. There has been controversy on the question of operative removal of retained secundines in the early interruptions of pregnancy but it is generally agreed that at full-term labor the uterus should be emptied. Retained placental lobules should be removed by gentle manipulation of the "sponge stick" without injuring the uterine wall.

Symptomatology.—Sepsis may assume so many forms in which the symptoms are different that it is necessary to discuss them under separate headings.

Endometritis and Metritis; Streptococcus.—The symptoms usually appear on the third or fourth day. There is a rise in temperature preceded often by chills or a chilly feeling. The temperature on the first day goes to 103° or 104° and is apt to remain high, without intermission, for several days. If the organism is very virulent the symptoms may appear earlier. As a rule the lochia is scant or absent and there is no abnormal odor. The leukocytes are high and a count of 20,000 or 22,000 is not unusual. In considering the value of the leukocyte count in diagnosing the condition it must be remembered that on the third and fourth day with increased secretory power and engorgement of the breasts, the leukocytes are normally 12,000 to 14,000 in number. When the streptococcus growth is limited to the endometrium and muscle wall of the uterus the patient, notwithstanding her fever, usually feels and looks as though she were in good health. With infection by this organism the endometritis and metritis are likely to extend through the lymph channels to the parametrium. The appearance of the temperature curve is pathognomonic. There is a high temperature for three or four days with a gradual approach to normal. After a few days the temperature again rises and remains high for a number of days.

Staphylococcus and Other Organisms.—As in the case of the streptococcus the temperature rises and there is a high leukocyte count and also a foul lochia. In the so-called sapremic forms or after the evacuation of the lochia by direct pressure on the anteflexed uterus or by means of ergot or pituitary extract, the temperature drops and the patient is well in three or four days. In any large hospital service there are a great many of these cases. There is a tendency nowadays to do away with the term sapremia.

If emptying the uterus of the infected lochia does not provide sufficient drainage the infection extends to the parametrium or to the peritoneum. In these cases after a considerable period of fever due to the pelvic cellulitis a fluctuating mass develops in the vaginal vault, necessitating drainage. Most of the thrombophlebitis and pyemia cases have the staphylococcus as the infective agent.

Bacteremia.—Bacteremia with the streptococcus as the causative organism is particularly virulent and the onset may be as early as the end of the second day. There is a chill and rise in temperature to 104°

or 105° with absence of lochia, a very low leukocyte count, perhaps only 6,000 to 8,000, and a continued fever until the fourth or fifth day when death may suddenly ensue. These symptoms signify an infected endometrium, a peri-uterine inflammation, a general peritonitis and the circulation and growth in the blood stream of hemolytic organisms. Other bacteria invading the blood stream may be the non-hemolytic streptococcus, the staphylococcus, or the colon bacillus.

Thrombophlebitis.—The infection originates in the placental site with a progressive thrombosis of the uterine and pelvic veins. After a number of days of high temperature there are intermissions with recurring chills and rising temperature, which represent renewed breaking-off of minute septic thrombi and their circulation in the blood stream. These cases may continue a long time, often to 30 days and occasionally to 50 or 60 days; and about 40 per cent of them recover. As many as 100 chills and acute rises of temperature have been recorded in one individual. This type of the disease is spoken of as pyemia and it nearly always ends in a septic inflammatory process in some part of the body, in the form either of bronchial pneumonia, septic joints, or abscesses in the viscera. Occasionally there is a mild septic process arising from the placental site or from the veins of the parametrium and extending into the large veins of the body including the common iliac and the femoral. The involvement of the latter vein gives rise to swelling of the leg and the condition is commonly known as "milk leg" or more properly, *phlegmasia alba dolens.* It comes late in the puerperium, usually from the fifteenth to the eighteenth day and there may be little or no temperature preceding or accompanying the swelling. Sudden death may follow movement of the clot in the veins. A bacteremia may have a mild septic course but lead to a localization and clotting of the large arteries, such as the femoral, with resulting gangrene of the extremities.

Gonococcus.—The gonococcus is an organism that is present, not infrequently, in the genital tract. It has been estimated to exist on large hospital services, in about 6 per cent of the patients. Smears for bacteriological examination should be taken from the cervix, vagina, and urethra and suitable treatment adopted during the pregnancy, not only to prevent further infection of the patient but to protect the child's eyes. Most sepsis cases in which the gonococcus is the organism involved are due to a leakage of pus and bacteria from inflamed tubes, and, generally, there is only a localized peritonitis. The present method of Credé expression of the placenta, before it

has normally separated from the uterine wall, is undoubtedly the cause of injury to the tubes and the production of fever of this type.

TREATMENT

Hygiene.—In the preceding paragraphs we have indicated the many predisposing causes of sepsis, especially the loss of blood, toxemia and prolonged labor. The next step is to consider the measures necessary for keeping the virulent strains of bacteria away from the genital tract. Certain essentials of hygiene must be observed for it is found that the normal vagina is not free of bacteria. The percentages of streptococcus found by Willa Frick (quoted by Williams) are really amazing: 14 per cent and 8 per cent respectively in the vulva and vagina of the indoor patients and 55 per cent and 75 per cent respectively in the outdoor patients. Almost without doubt these differences are due to indulgence in sexual relations by women living at home. Intercourse must be absolutely prohibited in the last three months of pregnancy and it should be prohibited throughout the pregnancy.

Ruge has shown that the incidence of sepsis depends upon the number of days or weeks preceding the labor, in which sexual relations have taken place. He examined 410 patients of whom 78.5 per cent had sexual relations during the last two months of pregnancy; 53.9 per cent during the last four weeks; 31 per cent during the last week; 20 per cent during the last three days and 9.5 per cent on the day of delivery. Of the women who had intercourse during the last three days 17 per cent had temperatures that lasted for several days or weeks. In our own hospital service we have had cases of streptococcus endometritis in patients who had spontaneous deliveries without examination but who admitted having had sexual relations in the last week of pregnancy.

Preparation of the Patient.—At the time of labor the patient should have a general bath of sponge or shower type but under no circumstances should she immerse her body in water because of the drainage into the vulva. She should be shaved with great care. It is conceivable that considerable harm might be done by carelessness in shaving and sponging the vulva. This applies also to the so-called pitcher douching following labor or later in the postpartum period. At the time of delivery, the vulva and the surrounding area of the thighs and abdomen should be rendered aseptic by the application of

50 per cent tincture of iodin. During the course of delivery the anal opening is a constant source of contamination.

Vaginal examinations are undoubtedly the means by which infection arises in most cases of sepsis. The bacteria may be carried by an ungloved hand or even by a gloved hand, because as it passes through the vulva contamination occurs from this area and from the lower part of the vagina. The fingers in search of information as to the condition of the cervix carry the bacteria to the cervix itself. Even if the examination is done with the most perfect asepsis it increases the morbidity by 6.5 per cent according to Johnston and Sidall. It has been the custom in this country during the last few years to make the examination by rectum but this method is not without its own peculiar dangers. In the attempt to determine the condition of the cervix or the position of the head the finger pressure on the rectal wall causes the secretions in the lower part of the vagina to pass to the cervix; in other words it necessitates rubbing or massaging the vaginal mucosa into the open and undilated cervix. Therefore all vaginal and rectal examinations should be abandoned in what is known as normal labor. During my service at Bellevue Hospital there have been no vaginal or rectal examinations on normal cases in the last three years. The obstetrician can invariably determine by abdominal palpation the presentation and position of the head and also its advance through the pelvic cavity. A vaginal douche is given in cases of delayed labor where vaginal examination is necessary.

The membranes should not be ruptured artificially until it is apparent that the delivery is imminent. Early rupture leads to infection of the amniotic cavity and the placenta. Slemons has shown that bacteria may be discovered passing through the walls of the vessels of the villi a few hours after the rupture of the membranes has occurred. Goldsborough also has shown the frequency of the infection of the uterine cavity after early rupture of the membranes. If the fingers of the obstetrician are kept away from the vagina the membranes are apt to remain intact until labor is far advanced. The intact bag of waters is of great value in dilating the cervix and spontaneous dilatation is the most complete and it follows that there is less liability to tears as the presenting part passes through. In vaginal examinations toward the end of labor the operator often attempts to aid by stretching the partially dilated cervix. This should never be done except after the most complete operative preparations.

Placental expulsion is usually accomplished by compressing the

uterus by the Credé technic. This method is likely to cause hemorrhage and to interfere with the normal cleavage of the placenta from the wall of the uterus thereby leaving placental shreds that later become infected and necrotic. Hart in particular has called attention to the disturbance of normal involution that is the result of needless and meddlesome attempts at Credé expression. Not only is there this danger from incomplete separation of the placenta but there is the possibility of immediate and severe hemorrhage if the technic is employed before the uterus has contracted. The so-called postpartum hemorrhage occurring in hospitals where junior house officers and students take care of the normal cases, is in reality intrapartum hemorrhage from this cause. The woman becomes exsanguinated during the third stage of labor and the placenta must be manually removed in order to relieve the hemorrhage. It is no exaggeration to say that this operation alone carries a 5 per cent mortality from the sepsis that follows.

Repair of Lacerations.—At the present time the medical profession has deemed it wise to take a neutral position in regard to actual repair of all lacerations of the genital tract occurring during labor. While it is generally accepted that lacerations of the lower part of the vagina and the perineum should be immediately repaired in order to prevent infection of the granulating wounds it is considered desirable to leave the tears of the cervix alone unless there is actual bleeding. In the latter case the lacerations must be repaired. The tears are allowed to remain unrepaired and even unknown because exposure of the cervix and entrance of the fingers into the lower uterine canal carries infection from the outside. The areas are so edematous that it is difficult to locate the tears of mild degree and stitches are either pulled too tight and there is sloughing or they are tied so loosely that they are of little benefit. In order to prevent the occurrence of hemorrhage in tears of the lower uterine segment extending into the vaginal vault, it is advisable to pack the vagina. The packing should be removed on the following day. This method gives a much better result than does the removal of the uterus or attempts to repair the lacerations from below. If the tear is in the posterior wall, the organ should be removed.

Drainage.—Immediately after labor and for 24 hours, the patient should be in a recumbent position, but following this period the upper part of the body should be raised and the patient put in the so-called Fowler position. This may be accomplished by means of a Gatch bed-

spring, raising the upper part and also the knee brake below. It provides perfect drainage from the vagina and prevents the accumulation of blood and infected material in the vaginal vault. In the absence of a Gatch spring, the head of the bed should be raised on blocks. This treatment may be considered not only as preventative but as of actual benefit in those cases where uterine sepsis has occurred.

General Treatment.—Patients who are septic should be out on the balcony in all but the most severe weather. At Bellevue Hospital, except in the middle of winter, patients are put on the balcony between the wards and screened from direct draughts. They should also be placed in the sun daily, but this suggestion must be adopted with moderation and the patients' eyes should be suitably protected by dark glasses. There was a time, a few years ago, when these women were put on a ward balcony and more or less forgotten; that is, no active treatment was provided for them and there was no specific treatment for the infection. To my mind such procedure is reprehensible.

Septic patients should be provided with easily assimilable food; under no circumstances should they be on a regular ward diet. In many clinics it is thought desirable to administer whiskey to these patients and I am in absolute accord with the idea, especially in prolonged illness or what is known as subacute sepsis. Usually the best form in which to give the whiskey is in eggnog but the quantity must be adjusted to the patient's needs. There is no doubt that this is of direct aid both as a stimulant to the appetite and as a form of nourishment.

The nursing care of these patients should be thorough and by nurses who have no other duties to perform. The gravest mistake is made in many institutions by providing a special day nurse for the septic cases but only a ward nurse for the night. Danger of transfer does exist but only by direct infection through careless nursing.

Patients who are septic should not be required to nurse their infants, as the nursing not only disturbs the patient but the milk is not good food for the child. It is common knowledge that the infant death-rate approximates the maternal death-rate, and this could be partially prevented by proper formula feedings. As a rule, in our treatment, if the temperature is high for more than 24 hours, the nursing is stopped and a tight binder applied to the breasts.

Local Treatment.—The perineum and vagina should be carefully examined for any signs of inflammatory reaction around the wound area that would indicate that a portion or all of the stitches should be removed so that drainage may be secured. It is a mistake to

open up fresh areas for infection, because bacteria pass with the lochia and the opening of the perineal wound often leads to new localization from which absorption occurs. If the temperature remains high over 24 hours it is a wise precaution to insert, under the most careful technic, which includes the straightening of the cervical canal, a tube through which a small suction tube is passed into the uterus and culture material obtained. This not only furnishes information concerning the conditions within the uterus and, as a rule, the bacteria involved in the disease, but it also straightens out the anteflexed uterus so that drainage occurs. Not infrequently the temperature subsides after this manipulation. Insertion of alcohol wicks or douching the uterus with 50 per cent alcohol or any manipulation within the uterus should be discountenanced. Vaginal douches should not be employed for they carry infected material into the uterus.

Specific Treatment.—Specific treatment was first used in these infections in 1895. Marmorek produced a serum for streptococcic infections which he used with some success. The following year Van de Velde produced a polyvalent serum which was used against all of the known strains of streptococcus. These serums were employed in very small quantities—amounts that we would consider insufficient. In 1899 a committee of the American Gynecological Society reviewed 352 cases treated with serum and reported in the literature; they came to the conclusion that the serum could do no harm, but was of little real value in the disease. A number of drug houses on the Continent and in this country have made polyvalent antistreptococcic serum but clinically it has been used in most instances only as a last resort. In 1911, Weaver and Tunecliff examined five samples of polyvalent serum and found that four showed evidence of value by raising the opsonic power against virulent streptococci injected into guinea pigs. The use of the pneumococcic serum gave impetus to the production of an efficient serum against the streptococcus. In pneumonia, 100 cubic centimeters of serum was given every 24 hours and it seemed advisable in using the antistreptococcic serum to give 100 cubic centimeters every 24 hours as a minimum dose. Quoting Weaver and Tunecliff again, they discovered that the reactivation by human blood of the inactive serum occurs at low dilution and it is possible that if the serum is to be effective it must be given in doses large enough to offer an opportunity for activation.

A polyvalent antistreptococcic serum has been prepared by the Mulford Laboratories under the direction of Huntoon and this serum we

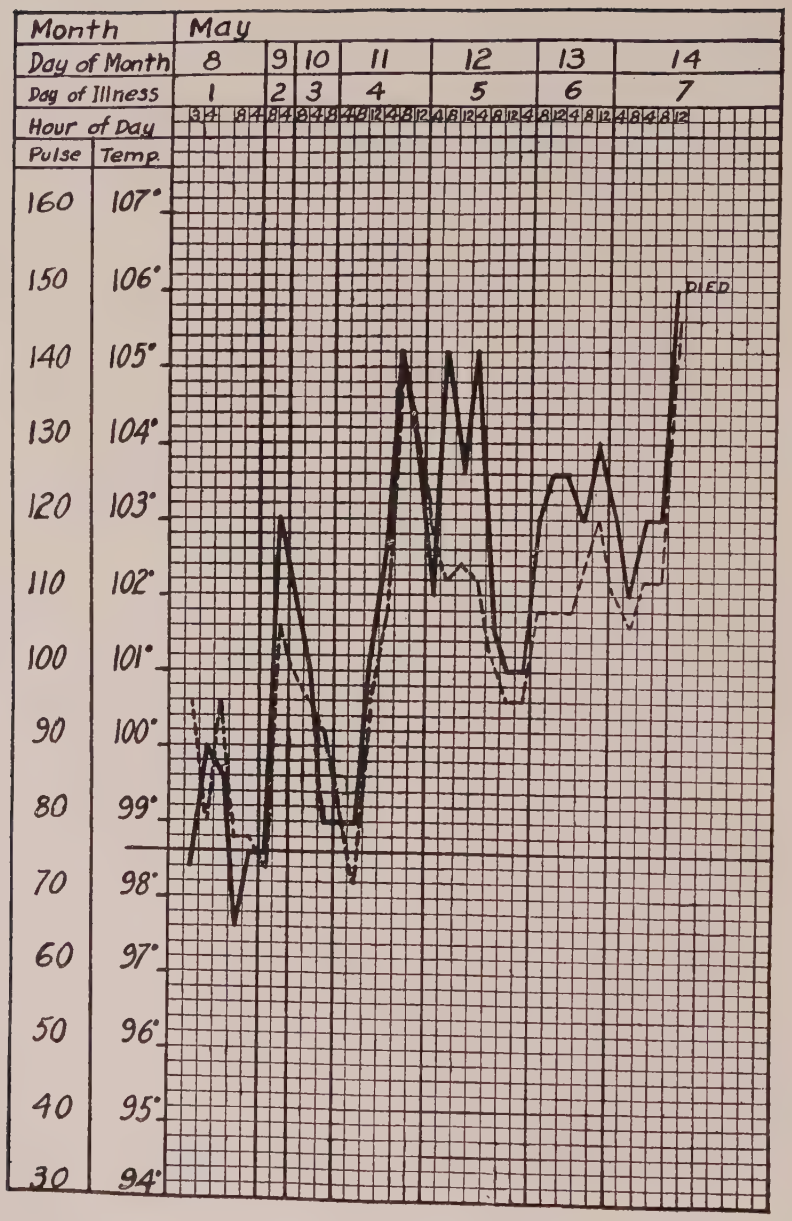


FIG. 25.—PUERPERAL SEPSIS.

Bellevue Hospital, May 8, 1921. Para xi. Spontaneous delivery. No rectal or vaginal examinations. Blood culture: hemolytic streptococcus. Leukocytes 6300. Death on the seventh day.

have used with considerable success. It is generally agreed that such serum does not carry direct antitoxin. There are, however, certain bodies in the serum, especially an immune opsonin, that stimulates the leukocytes to renewed activity and phagocytosis follows. It is possible that these bodies in the serum inhibit the action of an aggressin which tends to interfere with the activity of the leukocytes. We see evidence of the presence of such an aggressin in the low leukocyte count of severe infections. Some of the fatal cases in 1921 had a leukocyte count of 6,000 to 8,000 at the height of the disease. Of course it is possible that this serum actually contains direct antibodies; on the other hand the question might arise as to whether the good results are not due to the foreign protein injected rather than to any specific antibody content. Opposed to the latter idea is the work of Weaver and Tunecliff showing that horse serum alone has no power of raising the opsonic index in animals suffering from streptococcic infection. A polyvalent serum should contain all the known strains of the organism so that it will be active against streptococci found in the majority of cases of puerperal sepsis. The serum ought to be injected without awaiting the bacteriological information as to the diagnosis. If the temperature rises on the third day and remains high on the fourth, 100 cubic centimeters of serum should be given after a careful sensitization test has been made. If the erythema in such a test extends under 2 centimeters it is considered as negative. If the patient is hypersensitive, she may be desensitized by administering small doses beginning with a drop and increasing the amount to 1 cubic centimeter through the period of an hour. If the skin test is negative the serum is given very slowly and without dilution. If the temperature is high on the following day 100 cubic centimeters is again given and the dose should be repeated for 6 days in the absence of anaphylactic phenomena or serum sickness.

About 70 per cent of the patients will develop serum sickness with a rash and joint swellings with tenderness. These symptoms do not, as a rule, appear until after several days.

In the type of sepsis due to thrombophlebitis, with recurring chills and variations in fever the serum is of no use because the organism involved is the staphylococcus.

In the use of the antistreptococcic serum in 14 cases on the Bellevue Hospital service, 6 of which had positive intra-uterine cultures of hemolytic streptococci, there was an uncorrected death-rate of 21.4 per cent, or a corrected rate of 15.3 per cent. Philip Williams of

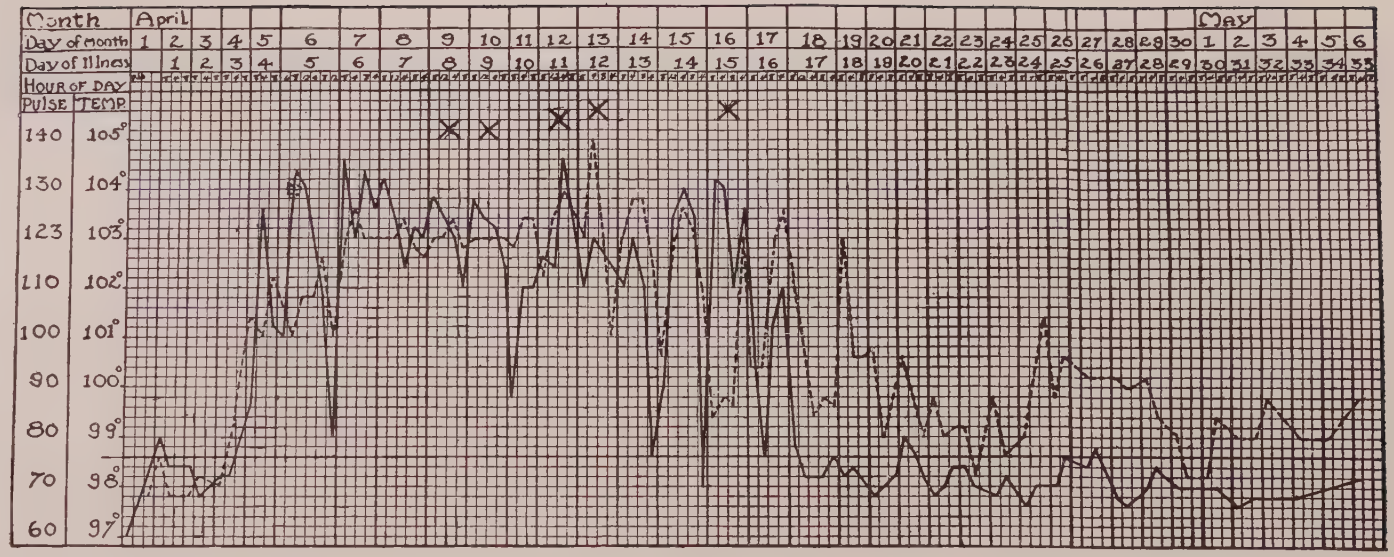


FIG. 26.—PUERPERAL SEPSIS.

Bellevue Hospital, April 1, 1923. Para iii. Spontaneous delivery. No rectal or vaginal examinations. Interuterine culture: streptococcus-hemolyticus. 100 cubic centimeters of polyvalent antistreptococcus serum given on the 5 days indicated. (Reprinted from the *American Journal of Obstetrics and Gynecology,* June, 1924.)

Philadelphia, treated 4 cases of postabortal hemolytic streptococcemia with positive blood cultures, and obtained a cure in each instance. At the Lying-In Hospital, Rosensohn analyzed the bacteremia cases in 1920 and 1922 and in 8 proved cases of streptococcus hemolyticus that were not treated with the serum, there was a mortality of 62.5 per cent.

Protein Therapy.—It has long been accepted that injections of foreign protein cause the body to offer increased resistance to infection. Injections of milk in puerperal sepsis were used as early as 1898. From time to time various other protein substances have been given, especially nucleic acid. In the injections of boiled milk there may be beside the milk protein a certain substance or endotoxin due to the growth or development of bacteria. It is probable that the increased value of the milk as compared with other proteins is due to this fact and it has been our custom to allow the bacteria to develop by placing the milk in the sun for several hours before boiling it. Considerable impetus has been given to the use of milk injections during the past few years and enthusiastic reports have come from the continent as well as from clinics in this country.

From the point of view of obstetrical conditions, this treatment is particularly good in cases of staphylococcus sepsis with parametritis or in any localized infection in the pelvis. Following the injection there is a temporary rise of the fever which is often succeeded by a restitution to normal. Occasionally large masses in the parametrium will disappear. As a rule it is necessary to make several injections and they may be given daily or every other day depending upon the reaction. These protein injections have no value in bacteremias. Before injecting a foreign protein one should be careful to make a sensitization test. There have been reports of several cases of anaphylactic phenomena following the injections.

Transfusion.—The transfusion of blood from a normal individual, selected with care by the matching of blood specimens, is of great value in the treatment of sepsis, particularly of the subacute form. Polak stated that repeated small injections to the amount of 250 cubic centimeters is the best method of introducing the blood. On the other hand the hematologists frequently give as much as 1,000 cubic centimeters. Experience indicates that 500 cubic centimeters is the appropriate dosage and should be repeated once or twice. It is usually better to allow three days to elapse between transfusions because of the reactions which frequently follow. As a rule transfusion is of use

in the streptococcus infections after the temperature has dropped to normal following the injection of the serum. It should invariably be used in the staphylococcus bacteremias. Perhaps the greatest use is as a prophylactic against sepsis. In the bleeding cases, especially placenta prævia and accidental hemorrhage, this is such an important part of the treatment that all obstetrical services should obtain funds for the payment of donors and a group of universal donors should be kept on hand. The house staff should be trained in transfusion methods so that no time is lost in the care of the exsanguinated patients.

Chemical Treatment.—Edward Piper has used mercurochrome by intravenous injection in some 12 cases of puerperal infection. He administers 5 milligrams per kilogram of body weight using 1 per cent solution.

Following Piper's report, Hugh Young used the substance in a number of cases and later published an enthusiastic report of his results. It has been administered in many individual cases but without notable success.

Young also used gentian-violet injections in staphylococcus infections but as yet others have not reported on its action. The use of these chemicals is still in the experimental stage. However, the mercurochrome injections are not without danger. In a personal communication, Douglas Symmers, pathologist at Bellevue Hospital, informs me that there have been autopsies on 14 patients treated with intravenous injections of mercurochrome in therapeutic doses, and that in each case death was due to the anatomical changes which characterize poisoning by mercury.

Operative Treatment.—Curettage of the uterus is apt to have a fatal ending, for it leads to direct-blood-stream infection through the breaking down of the local barrier of leukocytes. Hysterectomy has been done in this condition and some good results have been reported but it is an illogical procedure, for if there is merely an endometritis it is not necessary to remove the uterus, and if the general blood stream is infected hysterectomy cannot cure, although it does remove the infective source. Thrombophlebitis with recurring chills and rises in temperature has led to operations with a view to tying off the thrombotic veins. Williams of Baltimore and Miller of New Orleans have been favorably impressed by the procedure, but Williams has not employed it to any extent recently. The mortality following this operation is 50 to 60 per cent, which is as high as that of the disease itself. Knowledge of the pathology will almost preclude such an operation,

for these infected clot areas run into the larger veins and even into the venæ cavæ.

CONCLUSIONS

From a review of this subject it is apparent that the principal aids in eliminating these cases from our practice are: proper knowledge and regulation of the hygiene of pregnancy; the prevention of infection by the examining finger and the conduct of normal labor without vaginal or rectal examinations; the aseptic care of the puerperium and the lessening of the blood loss and trauma from difficult and prolonged labor by the adoption of appropriate operative measures. In the presence of sepsis, the careful conduct of the general treatment and the proper application of serological preparations will reduce the mortality.

BIBLIOGRAPHY

Bailey, H. Am. J. Obst. & Gynec., 1924, 7: No. 6.

Eden, F. W. J. Obst. & Gynec. Brit. Emp., 1922, 29: No. 3, 386.

Eichel, O. R. Report of New York Vital Statistics, Jan., 1923.

Eno, E. Surg., Gynec. & Obst., 1923, 36: 797.

Forty-fourth Annual Report of the Local Government Board, London, 1914-1915.

Gellhorn, G. Am. J. Obst. & Gynec., 1924, 8: No. 5.

Goldsborough, F. C. New York State J. M., 1924, 24: 721.

Hart, D. B. Edinb. M. J., April, 1920.

Johnston, R. A., and Sidall, R. S. Am. J. Obst. & Gynec., 1922, 4: No. 6, 645.

Miller. Surgical Treatment of Puerperal Pyemia, Clin. Congr. Surgeons of N. Am., Nov., 1916.

Polak, J. O. Pelvic Inflammation in Women, D. Appleton.

——— Tr. Am. Gynec. Soc., 1919, p. 152.

Piper, E. B. Tr. Am. Gynec. Soc., 1924, p. 239.

Rosensohn. Bull. Lying-In Hosp., 1923, 12: 214.

Rotunda Lying-In Hospital, Clinical Report for the Year 1921-1922.

Ruge, C. München. med. Wchnschr., April 16, 1921.

Slemons, J. M. Am. J. Obst., 1918, 78: No. 3.

White, Charles. J. G. Adami, J. Obst. & Gynæc. Brit. Emp., 1922, 29: No. 1.

Williams, J. W. Obstetrics, 5th ed., D. Appleton, pp. 997-1014.

Williams, P. F. Am. J. Obst. & Gynec., 1922, 4: 636.

Young, H. H. Arch. Surg., 1925, 10: 813.

CHAPTER V

INDUCTION OF PREMATURE LABOR

This subject is mentioned because of the fact that if induction of premature labor be improperly carried out it may readily increase both maternal and infant injury.[1]

Despite the fact that a certain group of obstetricians seldom resort to the so-called induction of premature labor, it must yet be admitted that under certain conditions, it has proved itself to be of very real value to both mother and child.

If the technic is carefully carried out and indications are carefully weighed, there is practically no risk to either mother or child from the procedure itself. Whatever blame has been attached to the method has come from improper selection of the case, faulty technic, or ignorance.

It is far better to leave a patient alone and allow labor to start spontaneously than to improperly carry out the induction in those cases that fall within the elective group. In certain groups of cases it may be imperative to start labor at once, because of the condition of either the mother or of the fetus, and then one is compelled to simply make the best of a difficult situation. "No elective induction should be carried out in any woman who is suffering from either a gonorrheal or other local pelvic infection."

The earlier in the pregnancy the induction is carried out—all things being equal—the harder it will be to obtain a rapid response and a fairly comfortable labor. A closed cervix with the canal still unshortened always means a difficult labor.

The important indications are (1) maternal and (2) fetal.

Maternal Indications.—The commonest cause for interference would seem to be an apparently contracted pelvis. In as much as the size of the fetus is quite as important as the size of the pelvic canal

[1] The propriety of a chapter on the induction of premature labor for inclusion in a presentation of prenatal care and heredity, may at first thought be questioned. When the reader considers the subject from the standpoint of subsequent pregnancies and the relationships that undoubtedly exist between the pregnancy in which induction may have to be practiced and the welfare of future pregnancies the reason will become apparent without further discussion.

and in as much as a very large percentage of cases of contracted pelves can be delivered either spontaneously or with but little help, if the labor is not hastened unduly, the induction of labor for this indication should not be undertaken rashly.

In borderline cases it is safer to give the patient a reasonable test of labor even though a cesarean section may have to be done. In cases of marked pelvic contraction, whether at the brim or at the outlet, the decision will usually be between an induction about four weeks before the end of pregnancy or a probable cesarean section. An elective induction prior to four weeks from term for anything outside of an intercurrent and unavoidable condition, would seem unwise and quite unjustifiable. The child of eight months has an excellent chance for life, but under eight months, the chance diminishes very rapidly.

The next most common maternal indication is seen in the *toxemias of pregnancy*. Here delay may mean death or at least invalidism.

Interference is advisable in hemorrhage, unless this is mild and shows a tendency to stop. Certain other conditions from time to time may demand the induction of labor, such as cardiac insufficiency, occasionally tuberculosis, and certain psychoses.

Fetal Indications.—The fetal indications for the induction of labor are:

1. Repeated instances of death of the fetus during the last days or weeks of pregnancy. (Such tendency in certain women is far from uncommon.)
2. Death of the fetus in utero
3. Oversize of the fetus

Repeated instances of the death of the fetus in the latter part of pregnancy are of extreme interest; they are probably not uncommonly dependent upon a toxic condition of the mother or upon numerous thrombotic processes in the placenta which gradually shut off more and more oxygen and food from the fetus.

Some of these cases are very hard to explain and most of them are difficult to determine satisfactorily. In certain of these patients there regularly occurs, at any time after the sixth month, either a retroplacental hemorrhage with separation of the placenta or total or almost total separation of the placenta with little or no bleeding. The writer has seen a number of these distressing cases. For several years his policy has been, first, to obtain a very complete history; second, to endeavor to clear up any kidney, or vascular, difficulty; and, third, to try to anticipate an accident by the induction of labor or by cesarean

section soon after seven and a half months, should the patient go that long.

In the presence of actual *death of the fetus,* one would expect nature to cast off the fetus at an early date. Such a procedure undoubtedly does take place in the average case within one to two weeks, although the time may be much longer. In the meantime, the patient is not being benefited by the condition, and it is wise in each suspicious case to endeavor to make an early diagnosis. Such diagnosis is often difficult and one should not be too hasty in reaching the conclusion of death *in utero.* The patient may be unconscious of fetal movements for several days and the physician may be unable to hear the fetal heart or fetal movements at any given time, and yet life may still be present. This illusion will usually depend upon excessive fat in the abdominal wall; upon the position or small size of the fetus, or upon polyhydramnios. If several examinations fail to detect heart beat or fetal movements, or if the patient continues to be unaware of fetal movement, labor may, as a rule, be brought on. The correctness of the diagnosis will be strengthened by a feeling of "malaise."

A further indication for the induction of labor is seen at times in the development of polyhydramnios, or in the presence of very great distention from multiple pregnancies.

Habitual *oversize of the fetus* is a relative term; but the condition seems to run in certain families. If labor is induced at all, for this condition, the procedure should be carried out at least three weeks before the expected date.

Methods of Inducing Premature Labor.—The three methods which I believe to be of particular value and which are safe if properly carried out are (1) the use of rubber bags, (2) the use of the bougie, and (3) packing.

In certain cases, chiefly of multiparæ, the cervix may be found to be considerably dilated, soft, and short, before the actual conscious onset of labor. Such cases of labor may be started by merely rupturing the membranes providing the head is low in the pelvis.

Use of Rubber Bags.—The only type of bag that the writer uses is the so-called Voorhees bag. This is a modification of the old, well-known Champetier de Ribes colpeurynter. These bags come in five different sizes although the fifth, or largest size, will practically never be used. These bags are sterilized by boiling for from 10 to 20 minutes. If not used immediately they should be kept in a solution, such as lysol.

They may be introduced either by the sense of touch or by sight. We prefer the former method except in those cases in which labor has to be induced while the cervix is still practically undilated. In the latter case it may be necessary first to obtain slight dilatation by means of a mechanical dilator. The direct introduction by sight is in these cases far more easily carried out because the cervical canal will be too small to admit both the examining finger and the bag.

When this method is used, the posterior vaginal retractor is introduced, the anterior lip of the cervix brought into view by means of a volsellum, or sponge holder, and the bag introduced. Slight anesthesia may be necessary.

When introducing the bag by means of the sense of touch, at least one finger, preferably two, should be inserted within the cervical canal to guide the introducing forceps into the cervix and well within the internal os. After the bag is introduced, the forceps is disengaged and removed, the bag being temporarily kept from coming out, either by the fingers in the cervix or by partial distention thereof, before the total withdrawal of the instrument. The bag is now filled with a sterile solution and completely distended. The stem is then temporarily clamped and finally tied in two places with sterile tape. This tube or stem, is thoroughly irrigated with lysol or other antiseptic, folded upon itself, and placed in the vagina. This latter step is not carried out in cases where the bag is used for placenta prævia or in cases where the dilatation is to be hastened by attaching a weight to the bag.

Before following out this technic, the patient *must* be surgically prepared, and the writer prefers a lysol douche both for its antiseptic properties as well as for the lubrication it affords. This is safer, in the long run, than the use of soap or oil, for these are not infrequently considered sterile when they are not. During the entire period that the bag is in place, the patient must, of course, wear a sterile pad, and be treated with the utmost antiseptic precaution. The cervix may well be touched with a weak iodin or alcohol solution.

When the bag comes out, the individual physician must decide whether to introduce a larger size or allow labor to proceed without further interference. The response to the bag varies greatly in individual patients. The time required to initiate labor pains may be anywhere from a half hour to 24 hours or more. My personal feeling is that the average multipara will respond actively within two to four hours, and the average primipara in from four to eight hours.

Introduction of the Bougie.—This method has been commonly called the "Krause method." Many men are often more familiar with the bougie than with the bag, and therefore, much prefer it to the latter. In the writer's opinion the bag is more satisfactory than the bougie, except in cases with an undilated, long cervix. In such cases, if the bougie is introduced carefully, and the vagina then packed tightly with sterile gauze, labor pains are more likely to be promptly initiated than with bags.

The two objections to the bougie, although these objections are not very great, are first, the fact that the membranes are easily ruptured, and second, that the danger of infection is somewhat increased.

The bougie—a catheter should never be used—must, of course, be absolutely sterile, and it is best introduced along the palm of the hand and finger, up through the cervix, into the uterus between the membranes and the uterine wall. It is almost impossible to do this properly without rupturing the membranes unless one finger can be inserted well within the cervix. The bougie should not be left in place more than 24 hours. If it fails to bring on labor, the bougie should be removed and the patient should either be left alone for a day or two, or a bag introduced. The same surgical asepsis is necessary.

Unless the induction is started in the late evening, it is a distinct help to allow the patient to be up and to walk around. Ten grains of quinin given by mouth will often prove of assistance.

One of the difficult features in the induction of labor consists in the need of properly handling the psychology of both the patient and her family. Any interference on the part of the physician tends to materially increase the nerve-tension of those immediately interested in the outcome.

A last precaution should be to impress the patient and her immediate family with the fact that we do not consider labor as beginning until the pains start to come at regular intervals (every 5 to 6 minutes).

The third procedure consists in the tamponade of the cervix and vagina. This method is not very satisfactory in the late months of pregnancy, but is of undoubted value in softening the cervix in the early months. If such tamponade is used, the gauze must be absolutely sterile and it must be used freely in order to have any real efficacy. In the late months of pregnancy, its chief value is in placenta prævia.

Induction of labor with either bags or bougie should not be carried out, except by the physician with particular training in obstetrics.

CHAPTER VI

INTRAPARTUM BIRTH INJURIES

Intrapartum injuries to the child are usually due to interference or neglect on the part of the operator during labor. However, they cannot always be charged to him, for occasionally they occur in spontaneous delivery after normal labor. The importance of this subject may be realized when it is remembered that traumatism during birth is the cause of 40 to 50 per cent of the stillbirths and neonatal deaths. At the Manhattan Maternity Hospital, in 100 consecutive autopsies in which the head was opened, it was found that 40 per cent of the infants had lost their lives from cerebral hemorrhage, and Holland has shown that in a group of 167 autopsies 50 per cent of the fetal deaths were caused by the complications of labor.

In addition to this high mortality there is also considerable morbidity from moderate hemorrhage. In such a case the child, after a struggle, recovers but is left with a permanent brain injury which may or may not interfere with the development of this organ. The child that survives a difficult forceps delivery may live, only to grow up feeble-minded and a charge to the community. Examination of the facts surrounding such accidents would indicate that the majority may be ascribed to conservatism and not to radical interference by the obstetrician. The following figures explain this statement: in the Manhattan Maternity group of 40 cases, mentioned above, 50 per cent of the stillbirths with intracranial hemorrhage were delivered spontaneously, 25 per cent followed forceps operations and 25 per cent were breech extractions.

A very small proportion of the mentally deficient children in institutions have a history of instrumental birth. Kuntzel found that of 450 idiotic children only 0.9 per cent were delivered by forceps, and a total of 4.5 per cent had difficult deliveries but no operative interference. At the Vineland, New Jersey, Training School for Abnormal Children, there was a history of extremely difficult and prolonged labor in 125 of 562 cases, and of these 54 had no instrumentation. Jelliffe and Peterson found that prolonged labor was active in the pro-

duction of about 18 per cent of the cases of idiocy and feeble-mindedness and Shuttleworth and Potts' figures based on 2,380 deficient children give a percentage of 17.5 of which 14.2 per cent were attributed to protracted labor and 3.3 per cent to forceps delivery. Stein in his paper, "Effects of Labor on the Brain of the Child," quotes Fletcher and Beech who obtained similar results: in 810 idiots there were 37, or 4 per cent, in which the condition could be charged to forceps, while 216 or 26 per cent were apparently the result of prolonged and difficult labor. It is quite evident from such statistics that there are opportunities for improvement not only in the type of obstetrics practiced but in the adoption of less conservative treatment of prolonged and difficult labor.

Head Injuries.—There are several varieties of head injuries that have been considered of minor importance but which, in the light of our knowledge of cranial stress as outlined by Eardley Holland, have acquired significance. The first condition is known as "moulding" of the head. If, in the moulding, there is extreme elongation in one direction with a proportionate shortening in another, there will be overlapping of the bones leading to brain pressure and, not infrequently, to rupture of the small veins that enter the longitudinal or other sinuses. At the outlet, the elongated and moulded head meets with the resistance of the pelvic floor and is pressed in such a way that the stress comes more or less suddenly in a different direction, thus leading to rupture of the falx or tentorium. Disproportion between the size of the head and the pelvis also leads to moulding. In spontaneous deliveries this abnormal pressure is probably the cause of stillbirths from cerebral hemorrhage.

Caput succedaneum, an innocuous condition, is edema of the scalp over the area that presents in the pelvic cavity and is produced either by the pressure of the side walls of the pelvis which interferes with the venous return, or by a tight cervical ring.

The localized swelling, known as cephalematoma, consists of blood beneath the periosteum and is the result of a difficult labor in which the presenting part is jammed with force against the wall of the pelvis. The babies so injured often die in the neonatal period, from cerebral hemorrhage caused by an occult fracture of the occipital or parietal bone. From hemorrhages outside of the injured bone, enough blood may accumulate in one or more areas to exsanguinate the infant who may succumb to the anemia. It has been customary to leave these cephalematomas alone, as turning out the clot is almost invariably

followed by infection. However, as fracture with depression may exist beneath the blood accumulation the question arises as to whether operative procedure with modern surgical methods might not give a better outcome than noninterference.

Denting of the frontal or parietal bone is another minor injury and is the result of labor in a flat pelvis. The promontory causes a depression as the head slides through the true conjugate. If the concavity, thus produced in the skull, is great enough it may give pressure symptoms or it may hinder the natural development of the bone. Occasionally the inner table of the bone is cracked at the high point of indentation, and hemorrhage has occurred beneath the dura. In this condition the policy of noninterference has generally been pursued. The most harmful form of treatment is that suggested by Kerr who grasps the head firmly around the brow and occiput and presses it in order to spring the indented bone into place. From a theoretical standpoint this might rupture the falx and tentorium. I have used the so-called Dublin method successfully a number of times; this consists in boring a hole through the middle of the indentation and inserting the sharp point of a volsella forceps beneath the bone in order to pull it back into place. This is readily done but it is not a proper surgical procedure as it is impossible to have a knowledge of what is happening under the opening, and the infant so treated may promptly die of dural hemorrhage. The best procedure is to make an opening in the skull and control the bleeding by lifting the bone into position. The indented furrow or groove which sometimes extends over the surface of the two bones should be lifted by the osteoplastic flap method as advised by Cushing. Greene has suggested that the cases of intracranial pressure can be relieved by drainage of the cerebral fluid through an opening into the dura made in the outer edge of the anterior fontanel. It is claimed by Sharpe that drainage by lumbar puncture satisfactorily relieves this increased pressure.

The osteoplastic flap resection has been done a few times but the mortality is high and it can do little more than relieve the intracranial tension and, therefore, in most cases where there is no indentation of the bone, it is inappropriate. In the case of head injury of the newborn it has been stated that there is a delayed clotting time of the blood, and it has been suggested by Rodda and others that cerebral hemorrhage occurs from this cause rather than from the stress and pressure. In the light of anatomical demonstrations especially those of Holland and Beneke, this explanation can hardly be accepted.

It is interesting to recall the work of the older writers on the subject. In 1861, Little, from a study of a group of cases of spastic paraplegia decided that the obstetrical history was of great importance. He intimated that difficult labor with operative delivery was the cause of cerebral hemorrhage affecting the motor areas but he also noticed that these hemorrhages occurred in children who were born spontaneously and that many of the cases in the latter group were premature children, so he came to the conclusion that asphyxia with the consequent rise in the pressure and filling of the veins had a great deal to do with their rupture.

Virchow pointed out that the veins of the cortex have little support as they enter the sinuses and in recent times Cushing has mentioned

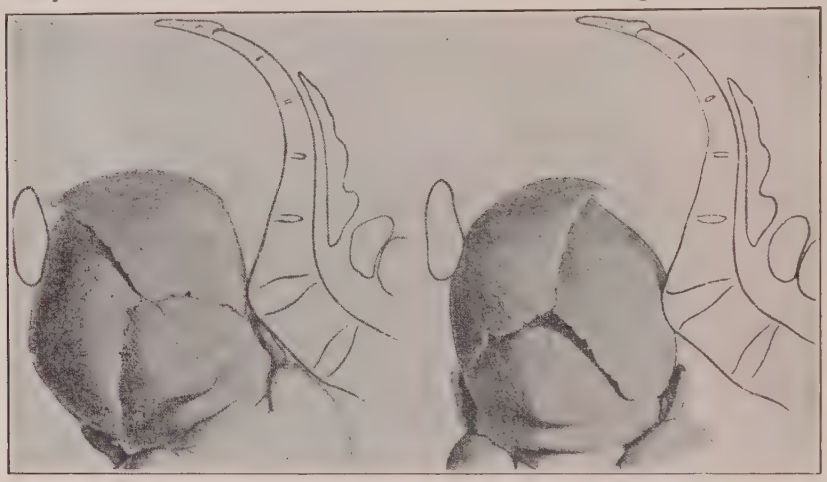


Fig. 27.—Asynclitism with Overlapping of the Parietal Bones

Apt to occur in flat pelvis and may lead to rupture of the cortical veins as they enter the longitudinal sinus. (From Bumm, *Grundriss zum Studium der Geburtshilfe*)

this peculiar anatomic condition and agrees with Little that asphyxia neonatorum may lead to rupture of cerebral veins just as this condition sometimes occurs in the asphyxia from spasms of whooping cough.

In 1885, Sara McNutt reported three breech cases that had had extravasation of blood over the vertex which indicated that the overriding of the parietal bones had injured the venous tendrils leading to the sinuses. Of course we all know that the same distortion and overlapping of parietal bones occur in head foremost presentations in cases of contracted pelves where an asynclitic position of the head is assumed in the attempt to pass the obstruction at the pelvic inlet.

In studying the more recent work on the subject which seems so all conclusive we must not forget the older well proven presentations.

However, with the head so injured that symptoms of intracranial pressure develop, the hypodermic administration of 10 cubic centi-

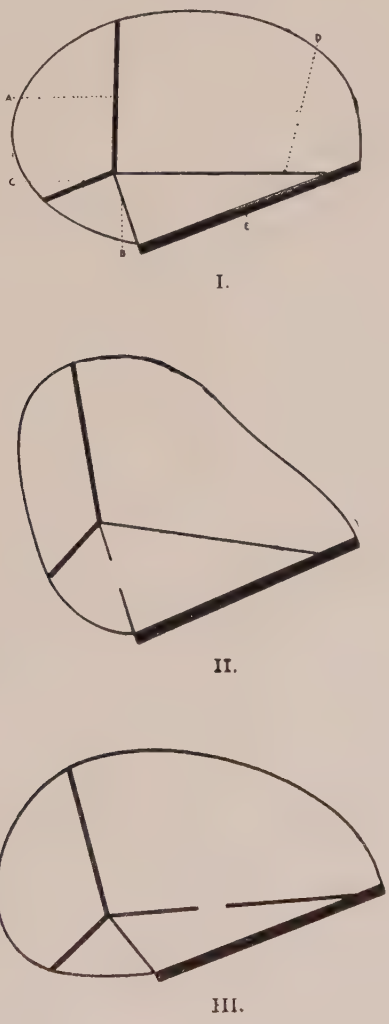


Fig. 28.—Diagrammatic Outlines of Head and Septal System of Dura Mater.

The lines representing the septa show their chief directions of strength. (A) falx cerebri, (B) middle (vertical) part of tentorium cerebelli, (C) line of junction of tentorium and falx, (D) anterior (horizontal) part of tentorium cerebelli, (E) base of skull. I. Normal shape of head. II. Shape of head during compression in occipitofrontal diameter. III. Shape of head during compression between vault and base; greatest strain on horizontal part of tentorium. (Eardley Holland, *Report on the Causation of Fœtal Death,* Ministry of Health, London.)

meters of human blood every 6 or 8 hours for a few doses, combined with absolute quiet for the child for 4 or 5 days has resulted in

recovery. At first it was thought advisable to administer only the serum and I think that this is the most satisfactory method; but for immediate results the whole blood is nearly as good. This empirical use of the whole blood or serum injections was first demonstrated to me by Oscar Schloss in a child who had had numerous convulsions

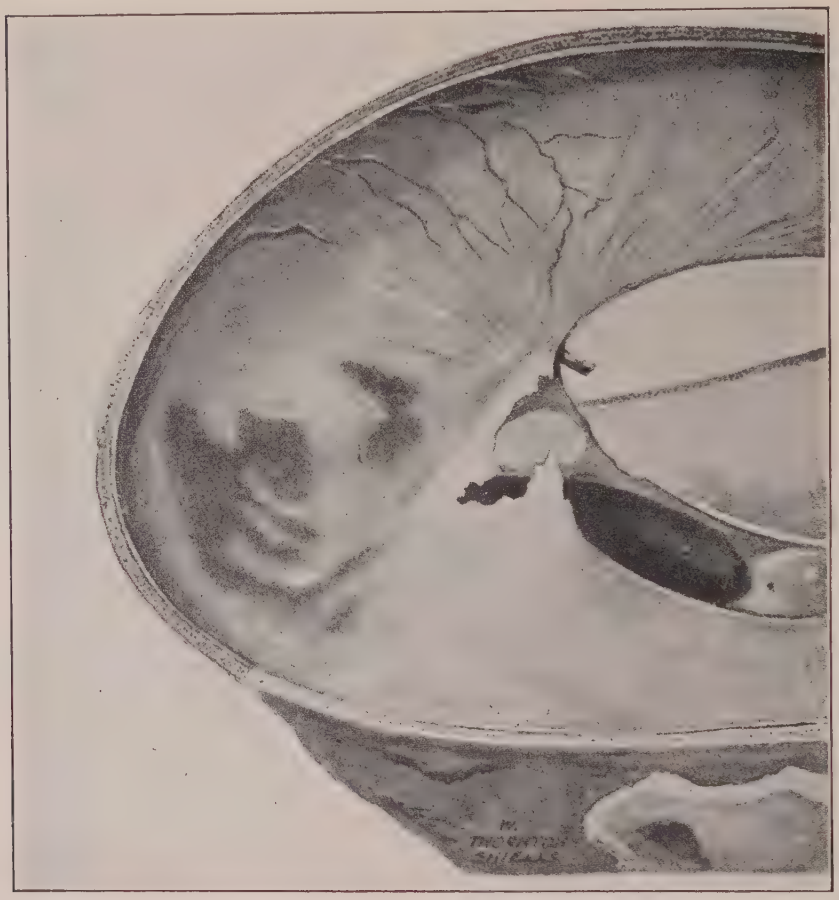


Fig. 29.—Complete Bilateral Tear of the Tentorium Cerebelli.
On the right side the anterior vertical band has been torn through; on the left side the anterior border of the band has remained intact. (Eardley Holland, *Report on the Causation of Fœtal Death,* Ministry of Health, London)

after a forceps extraction. The infant had no convulsions after the blood was given and has now developed into a normal three-year-old child. This procedure is harmless and I strongly advise its use.

Major injuries to the skull in forceps extraction are relatively infrequent and are usually due to the slipping of the blades; the child

generally loses its life during the course of the delivery. Beneke, in 1910, was the first to call attention to the rupture of the falx and the tentorium as a common cause of death. Meyer and Hauch found tears of the dural septum in almost one-half of the babies dying during or within a few minutes of birth. Vischer, in 1919, found that in 21 infants with intracranial hemorrhage 17 had tears of the septum. Holland, in 1922, examined 167 fresh fetuses and found that in 81, or 41 per cent, the tentorium cerebelli was ruptured, and in 5 cases was associated with the tearing of the falx cerebri and in all but 6 cases there was also subdural cerebral hemorrhage. Of these 81 fetuses there were 46 vertex deliveries, 25 of which were delivered by forceps and 19 spontaneously; 35 of the infants were delivered by the breech.

The vault of the head consists of bones which are movable and which are fastened to the dura beneath, with the fibrous septa passing between the two halves of the brain and also separating the cerebellum from the cerebrum. The fibrous extensions are important because they bear a relation to certain of the blood-vessels. The tentorium should be particularly considered as the vein of Galen runs along the top of it to the point where it enters the straight sinus into which drain several tributaries supported by the fibrous sheath. The falx does not support many vessels and, therefore, tears and ruptures are, so far as we know, more or less harmless as regards the life and health of the child; in other words, tears of the falx and tentorium become of major importance only as they produce rupture of the vessels. The large number of deaths that are due to excessive cranial pressure or stress, in Holland's group of 167 stillborn fetuses, is a somewhat unexpected discovery and indicates to what extent this condition is responsible for the stillbirth mortality. As a matter of fact it is a more common cause of fetal death than all other causes put together.

Injuries to Spinal Cord and Vertebræ.—Five-sixths of the stillbirths in breech deliveries show tears of the septum and cerebrospinal hemorrhage. In either spontaneous or artificial breech delivery, when the head passes through the pelvis, the diameter passing squarely or obliquely in the true conjugate is subjected to a sudden vertical strain and overlapping of the parietal bones in the region of the longitudinal sinus. It is evident that if a breech delivery is to be successful, the child's head must be very slowly and carefully forced through the long diameter of the pelvic inlet by graduated pressure from above. Furthermore the child's head must be in complete flexion before the

pressure is exerted so that the smallest diameter of the head is advanced. Bronson Crothers has shown that delivery by the breech, according to the so-called Smellie-Veit method, exerts traction upon the cord and also increases the length of the spinal column, causing the medulla to impinge upon the rim of the foramen magnum, and

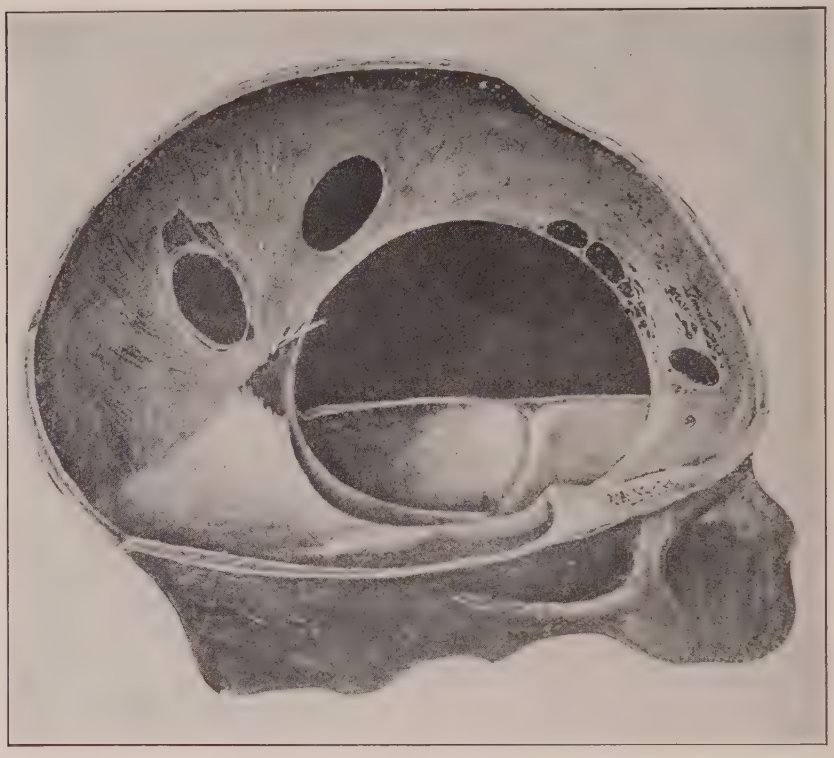


FIG. 30.—COMPLETE TEAR OF TENTORIUM CEREBELLI, ELLIPTICAL TEARS OF FALX CEREBRI.

The tear is in the right side of the tentorium. The anterior one-third of the line of junction between the tentorium and falx has been torn through. The straight sinus (indicated by bristle) has been opened. (Eardley Holland, *Report on the Causation of Fœtal Death,* Ministry of Health, London)

especially is this true if the medulla does not have the support of the tentorium.

A. Couvelaire, in 1907, examined 51 infants dying within a few hours or days of birth and found 11 cases of hemorrhage in the central nervous system. As a result of his observations he decided that in the child born near term the spinal canal is more often the site of hemorrhage than is the brain. In 4 cases the medullary hemorrhages were in the cervical region and in 1 case they reached

the bulb; in 2 other cases they were in the dorsal region. The most frequent location of the hemorrhages is in the interstitial zone between

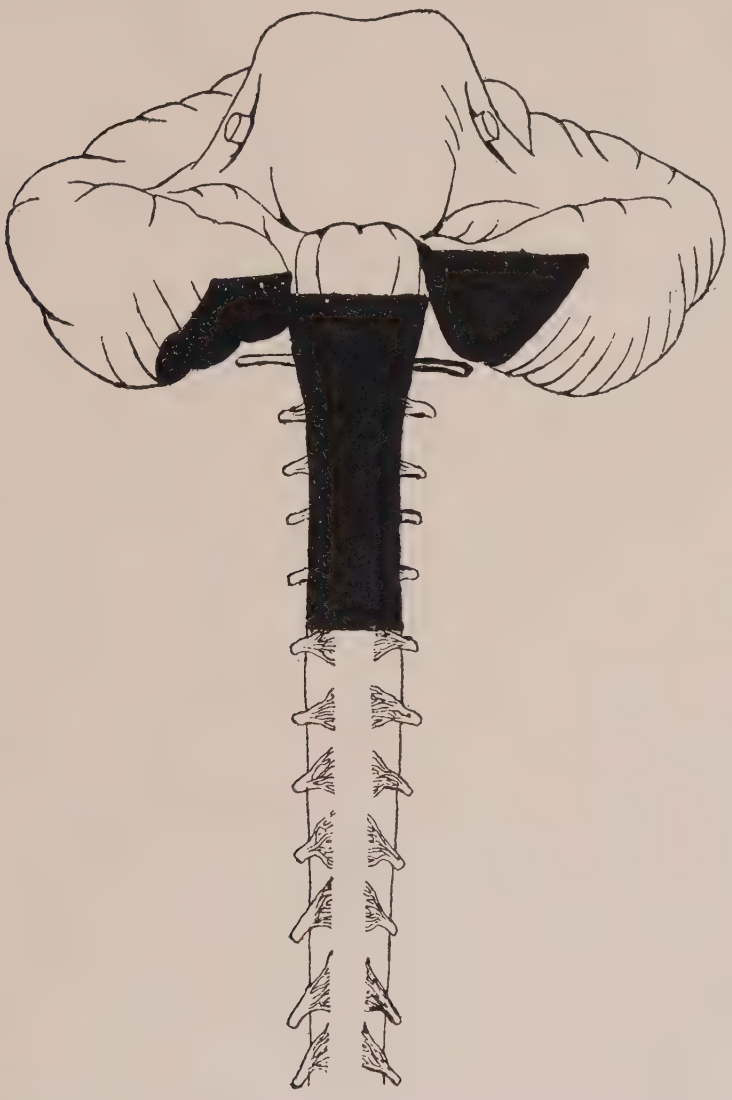


FIG. 31.—FORCEPS DELIVERY WITH HEMORRHAGES AT THE BASE OF THE BRAIN AND THE UPPER PART OF THE SPINAL CANAL.

(A. Couvelaire, "Hémorragies du système nerveux central des nouveau-nés dans les accouchements terminés par le forceps," *Annals de gynécologie et d'obstétriques*, Jan., 1907)

the anterior horns. Couvelaire found that in any given case it was difficult to determine whether the hemorrhage was due to the action

of the forceps or to elongation produced by manual breech extraction or to compression of the fetal head by maternal parts.

The same author, in a paper written in 1903, on hemorrhage of the central nervous system of the newborn, noted that cord hemorrhages, both medullary and bulbar, with or without association of cerebral hemorrhage, were observed almost exclusively in infants weighing 3,000 grams or more. They were observed 6 times after difficult labor with forceps delivery, once after breech extraction and twice after compression of the cord. The hemorrhages attributed to forceps appear to be essentially medullary and bulbar hemorrhages. The cerebral substance remains unharmed in fetuses that have reached full intra-uterine development except, of course, where there is direct injury. In conclusion he states that the hemorrhages occurred most frequently in the cervical and bulbar canal at a distance from the area of compression. The excess of intracranial pressure tends to exaggerate the engagement of the amygdales or lowermost lobules of the cerebellum in the spinal canal. It is also interesting to note his statement that existing vascular lesions, particularly those of hereditary syphilis, constitute a predisposition sufficient to determine a bulbomedullary hemorrhage on the occasion of minimum pressure produced by forceps applied in conditions that appear to be mechanically simple.

There is some evidence that these hemorrhagic lesions are exceedingly common and that many of them exist without causing any great damage. William Sharpe and his associate Espajo, in 100 cases of newborn infants taken consecutively within 48 hours of birth found 9 per cent with bloody spinal fluid indicative of intracranial hemorrhage. All of these deliveries were normal or nonoperative. Sharpe and Maclaire in examining another 100 consecutive cases for the purpose of checking the first report, took the fluid at times ranging from 9 minutes to 100 hours after birth. In 6 of the cases, the canal could not be entered; of the remaining 94 there were 13, or 13.8 per cent, with bloody spinal fluid. These deliveries were not all spontaneous; there were 10 forceps cases of which two showed bloody spinal fluid. There were also 10 babies with a syphilitic history two of whom had a bloody fluid. In the 13 cases there was but one breech delivery. It is interesting to note that these observers controlled the finding of the bloody fluid by investigating the clotting of the blood itself. This was estimated within 24 hours to 48 hours after birth and in no case was coagulation prolonged.

Pierson examined the spines in 25 cases of version and in 11

breech deliveries all followed by death of the viable fetus. Fourteen or 38 per cent showed fractured vertebra and of these 7 were primary breech cases and 7 were versions with breech deliveries. There were 9 dead births, 4 deaths at birth and one neonatal death. The typical lesion in these cases was separation of the epiphyseal plate of the sixth vertebra with intraspinal hemorrhage. He believes that the present mortality rate of 10 to 15 per cent for breech extraction in maternity hospitals, may be attributed to the rapidity with which these infants are extracted.

Holland arrived at similar conclusions in regard to rupture of the tentorium, and he states that a new proceeding should be adopted for breech deliveries, that instead of forceful haste, deliberate and gentle extraction should be employed on the after-coming head.

Injury to the Extremities.—Fracture of the clavicle is the injury that occurs most frequently. As a rule the fracture is found in breech deliveries but it may occur in vertex presentations. Ehrenfest states that Muus observed 5 such fractures in 100 nonoperative deliveries and the incidence of the clavicular fracture in all types of deliveries was 1.5 per cent. The probabilities are that this type of fracture is often overlooked because it is incomplete or because the periosteum is not ruptured. The fractures that take place in the extraction of the after-coming head are almost entirely due to trauma caused by the fingers slipping over the clavicle in the typical Smellie-Veit method of extraction. However, they may be caused by indirect pressure in restoring the nuchal arm to a proper position or in bringing down an extended arm. In vertex cases the fracture occurs by passage of the shoulders through a contracted pelvis, or as a result of strong traction on the head when the anterior shoulder is caught behind the symphysis. In 16 fractures observed by Hauch, 13 were of the clavicle of the anterior shoulder. Muus also found the anterior clavicle broken in 15 of the 18 cases where the mechanism could be determined. In 60 forceps cases he found 5 with the clavicle fractured.

Occasionally the bone ends are dislocated either at the sternal or acromial junction. Not infrequently fracture of the middle of the bone gives no symptoms. The infant moves its arm and there is no hematoma or other direct evidence of injury, the formation of the callus being the first sign of the condition. When the fracture is uncomplicated by nerve injuries the result is invariably good. As a rule there is no deformity and the callus is gradually absorbed.

In extracting the shoulders it is important to lower the head sufficiently to release the anterior shoulder from beneath the symphysis

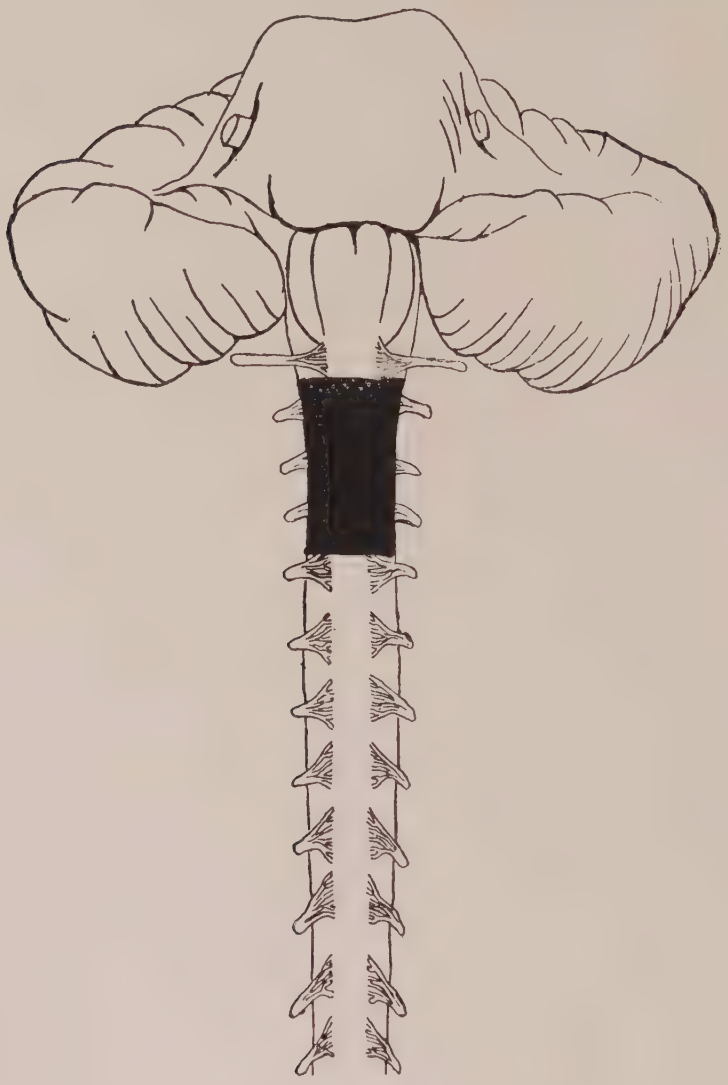


FIG. 32.—FORCEPS DELIVERY WITH HEMORRHAGE IN THE SPINAL CORD IN AREA FROM SEVENTH TO FIFTH CERVICAL VERTEBRA.

(A. Couvelaire, "Hémorragies du système nerveux central des nouveau-nés dans les accouchements terminés par le forceps," *Annals de gynécologie et d'obstétriques*, Jan., 1907)

and, of course, the fingers should never be hooked in the axilla to aid the delivery. If the shoulders are not readily delivered the proper

procedure is to free the child's mouth of mucus and await the uterine contractions to expel the body or to aid in the expression by pressure from above.

The treatment of these fractures is simple. Usually the healing is prompt and it is necessary only to have the bones in apposition. Strapping and flexing the arm to the chest is sufficient for immobilization.

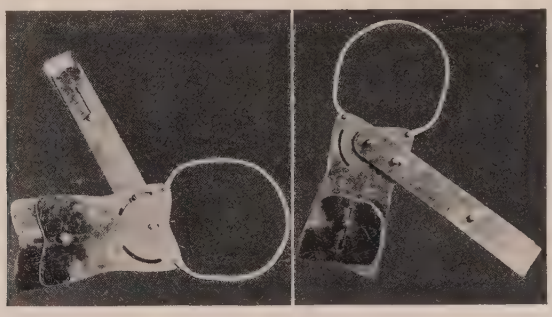


Fig. 33.—Metal Frame with Extension Arm for Treatment of Fractures in the Newborn.
(Carl Steinke, *Surgery, Gynecology and Obstetrics,* June, 1924)

Fig. 34.—Baby Tied to Frame with Arm in the Cast.
(Carl Steinke, *Surgery, Gynecology and Obstetrics,* June, 1924)

Fracture of the Arm.—The most frequent fracture is that of the upper arm and almost invariably it occurs from attempts on the part of the operator to displace an extended arm or an arm that is in the so-called nuchal position. In former years this fracture was more common than it is now; a fact that throws a side light on the present-day method of delivery in breech cases. The old method of extraction was by traction downward; the arms were sought for when the umbilicus reached the vulva and if the arms were extended or the position was abnormal they were brought into place by finger traction

or pressure. In normal breech cases to-day, the delivery is almost without exception spontaneous until the umbilicus is born, when with pressure from above and but moderate traction from below, the anterior or posterior shoulder is allowed to deliver spontaneously. Usually if the arm is sought for it is found within the vagina and easily extended.

The fracture occurs in the middle or upper third of the arm. However, epiphyseal separation occurs occasionally and it is quite possible that this form of fracture is associated with Erb's or Duchenne's paralysis. The symptoms of a fracture are ordinarily self-evident and the treatment requires apposition of the bone ends and immobilization. Traction is desirable in these arm fractures in order to keep the parts in apposition and Steinke has devised a splint that is most satisfactory. The apparatus is an aluminum platform with an extension rod that can be regulated through a certain radius, which is sufficient to keep the arm at a proper angle. The union is generally good and without deformity. However, progress should be controlled from time to time by x-ray examinations.

Lower Extremities.—This fracture takes place in the middle third of the thigh and is due to attempts at extension in the presence of an impacted breech. It is avoidable and its occurrence denotes improper obstetrical technic. These fractures are the most difficult to handle; there must be traction upon the lower fragment in order to keep the bone ends in apposition. A simple traction apparatus with a wooden frame can be made, or Steinke's apparatus for arm fractures can be rearranged by inserting the traction rod on the lower part of the platform. Both arm and leg fractures heal in a remarkably short time and in 3 or 4 weeks there is complete union.

Nerve Injuries.—*Duchenne's or Erb's Paralysis.*—Duchenne's or Erb's brachial birth palsy occurs about once in every thousand cases and is the result of difficult shoulder delivery. Since it was first described there have been three schools of thought as regards its origin. Duchenne, in 1872, stated that it was due either to subluxation of the shoulder with injury to the contiguous nerves from pressure, or to traumatism to the nerve trunks by the actual pressure in the axilla of the finger of the operator.

Two years later Erb classified the lesion as an injury to the fifth and sixth cervical nerves at a point 3 cm. above the clavicle and at the posterior edge of the sternomastoid muscle. Recently it has been suggested that this injury was caused by the separation of the

humerus at the epiphyseal junction and injury to the adjoining nerves by displacement and callus formation.

The majority of orthopedic surgeons believe that the palsy is due to actual rupture of the cervical nerves either at their exit from the spine or further down in the neck, usually in the region called Erb's point. Taylor, the greatest exponent of this belief, has performed as many as seventy operations for the repair of injuries to the nerve trunks. He remarks: "There is present, then, torn fascia, torn muscle, torn nerve sheath and torn nerve, all infiltrated with blood from the torn vessels. As time passes a hard cicatrix binds all these structures together and forms an impassable barrier to regenerating nerve and to nerve impulses."

Thomas believes that the condition is due to subluxation of the head of the humerus and there is no doubt that this condition actually exists in the cases that have this type of injury. This posterior subluxation has been explained by Taylor and others as a result of paralysis of the external rotator muscles—the infraspinatus and the teres minor. The internal rotators, pectoralis major and latissimus dorsi, being only partially paralyzed, pull the head of the humerus outward and backward.

Many of these cases clear up spontaneously following fixation of the arm at an angle of rest with daily massage and manipulation and only a small proportion remain paralyzed through life. If there is an improvement with full use of the arm it is difficult to believe that the origin of the injury is a rupture of the nerves or the nerve sheaths. It would seem more likely that the paralysis was a result of subluxation of the bone.

There is a similar obstetrical palsy, undoubtedly caused by pressure, that ends in recovery and to which attention should be called in discussing this subject. Duchenne, in 1862, mentioned the arm palsy only after discussing facial paralysis. Facial paralysis is usually due to pressure of the forceps blade upon the nerve trunk. Carrying the analogy further, one could conceive that the rupture of the cervical fascia with hemorrhage would produce the pressure on the nerve trunks which would be relieved following the absorption of the blood. The forceps procedure, especially with the long or high forceps, when the head is in an asynclitic position not infrequently causes hematoma and injury in the region of Erb's point, and during the neonatal period a hard hemorrhagic mass can be felt in the border of the sternomastoid muscle. It is claimed by Taylor and others that the

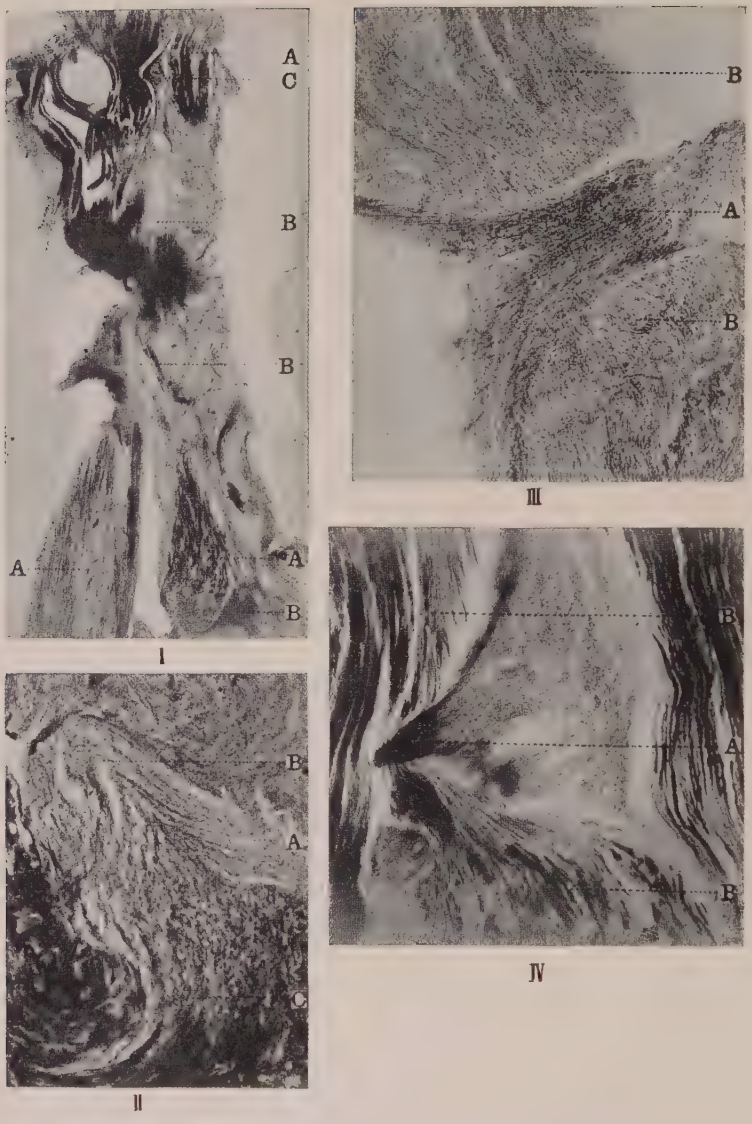


FIG. 35.—SECTIONS SHOWING NERVE INJURIES.

I. Longitudinal section. A. Degenerated nerve fibers. B. Hemorrhages in perineural sheath. C. Buckling inward of perineural sheath upon nerve fibers. II. A. Nerve fibers showing kink at B and terminating in a connective tissue mass at C which contains blood clot. III. A. Band of connective tissue constricting nerve bundle B. IV. A. Buckling of perineural sheath compressing nerve fibers. B. Broken-up remnants of myelin sheaths. (Alfred S. Taylor, *Surgery, Gynecology and Obstetrics*)

rupture occurs by overstretching the neck when lowering the child's head for the purpose of delivering the anterior shoulder. There is no question that such overstretching will cause rupture and it has been proved by experimental work on the cadaver. On the other hand it is well known that in a difficult shoulder delivery, midwives and others will insert a finger in the axilla and in this way cause rupture of the shoulder joint and also direct injury to the nerve plexus. As many as 30 cases have been noted in the practice of one midwife.

Diagnosis of paralysis is obvious and is made usually on the first day of the child's life. X-ray examinations of these cases are essential and not only should the plates be examined for dislocation or fracture but the epiphyseal line should be carefully considered for evidence of edema or callus formation. Obstetricians usually treat arm paralysis by fixing the arm with the hand across the chest, a favorable position for many reasons. If the fracture is the outer end of the clavicle or in the shoulder joint or at the epiphyseal junction, this position is good, whereas, if the arm is extended outward in an angular splint as is commonly done by the orthopedic surgeons, knowledge of the shoulder joint is first required and must be controlled by x-ray examinations. It is certain that early fixation is desirable but upon leaving the hands of the obstetrician the patient should be turned over to the orthopedic surgeon. They, as a rule, feel that there should be three months trial with this method of fixation with some manipulation. If, after the third month, the paralysis appears to be permanent operative procedures should be considered.

Facial Paralysis.—Paralysis of the facial nerve is usually caused by pressure of the forceps on the nerve at its exit near the sternomastoid foramen. It also occurs from intracranial injury either from rupture of the tentorium and hemorrhage on the lower surface of the brain or from direct injury to the petrous portion of the temporal bone; the latter is an uncommon injury. This type of paralysis occurs in normal spontaneous deliveries and 36 cases have been reported. The probabilities are that the head meets with some obstruction in its downward course, possibly the promontory of the sacrum. In both simple flat and generally contracted pelves, we have injuries to the temporal bone and, especially in the generally contracted pelvis, there is often a straight line depression running up from the malar prominence. If paralysis is from pressure on the nerve after it leaves the

foramen it almost invariably clears up without treatment. Other nerve symptoms determine whether or not the injury is intracranial. There may be paralysis of the ocular motor fibers and usually the child will give symptoms of intracranial pressure. In these cases possibly a great deal of good may be accomplished by tapping the spinal canal and by intramuscular administration of blood.

Conclusion.—It is well to remember, as Ehrenfest has stated, that all of these injuries to the newborn may occur in spontaneous deliveries and we should not be too ready to criticise the obstetrician for faulty technic or manipulation in operative delivery. However, there are one or two common faults that should be eliminated: (1) Disproportion between the head and the pelvis must be estimated before the labor, or early in labor, and attempts to extract a head which is not fully engaged must cease. The low transperitoneal cervical cesarean section permits of a trial labor and if the head does not enter the pelvis the baby may be saved without undue risk to the mother. (2) In breech deliveries the passage of the head through the pelvis must be slow and the head must be fully flexed by means of a finger of one hand in the mouth and the finger of the other pressing up the occiput. (3) In the extraction of the shoulders, the head must be kept in alignment in order not to overstretch the neck and the fingers must not be inserted in the axilla for traction. (4) Fracture of the long bones must be set with as much care as is employed with similar fractures in an adult.

BIBLIOGRAPHY

Bailey, H. Am. J. Obst. & Gynec., 1920, 1: No. 1.
Beneke, R. München. med. Wchnschr., 1910, Vol. 62.
Crothers, B. Am. J. M. Sc., 1923, 165: No. 1, 94.
Cushing, H. Am. J. M. Sc., 1905, 130: 563.
Ehrenfest, H. Birth Injuries of the Child, D. Appleton, pp. 8, 159.
Green, R. M. Boston M. & S. J., 1914, 170: No. 18.
Holland, E. Report on Public Health and Medical Subjects No. 7, Ministry of Health, London, 1922, p. 46.
Kerr, J. M. M. Tr. Edinb. Obst. Soc., 1901, 26: 42.
Pierson, R. N. Surg. & Gynec. Obst., 1923, 37: 802.
Rodda, F. C. J. Am. M. Ass., Vol. 75.
Sharpe, W. J. Am. M. Ass., 1923, 81: 620.
Sharpe, W., and Maclaire, A. S. Surg., Gynec. & Obst., Feb., 1924, 200.
Stein, Arthur. Labor and Brain of the Child, Tr. Am. M. Ass., 1917, Sect. Obst., Gynec. & Surg.

Steinke, C. R. Surg., Gynec. & Obst., June, 1924, 823.
Taylor, A. S. Surg., Gynec. & Obst., May, 1920, 494.
Thomas, T. T. Am. J. Obst., 1916, 73: No. 4.
Vischer, A. L. Abstract. Zentralbl. f. Gynäk., 1919, Vol. 43.

CHAPTER VII

SHOCK FOLLOWING ACCIDENTS OF LABOR

Forty or fifty per cent of all maternal deaths are due to accidents of labor which in many instances are followed by the development of shock. In general, shock is caused by (1) loss of blood, (2) injury to an organ, (3) lowered intra-abdominal pressure resulting from rapid delivery in patients with a high blood-pressure, (4) operative delivery of exhausted patients who are suffering from acidosis. Depending upon the abnormality and the measures taken to correct it, the patient may develop primary or secondary shock.

Primary Shock.—Primary shock occurs following the loss of a large amount of blood, as in cases of antepartum and postpartum hemorrhage, or in ruptures of the uterus involving the uterine artery. Death takes place in a few moments.

The same condition also develops without hemorrhage, in patients who have a marked acidosis due to a long labor or toxemia, such as eclampsia or pernicious vomiting. Uterine contractions continued over a long period result in the accumulation of acid bodies that are produced through two mechanisms. In the first place the starvation accompanying a labor extending more than 24 hours leads to combustion of body fat and the consequent increase of acid substance; and second, the carbon dioxid combining power is reduced by the waste products formed by the contraction of muscle tissue. We must also consider the loss of CO_2 due to excessive pulmonary ventilation.

Such a labor eventuates in a condition of acapnea, as described by Yandell Henderson, in which the respiratory mechanism fails owing to the loss from the body of the protective carbon dioxid. On administering an anesthetic to such a patient, sudden death may follow because of the respiratory failure that comes on as soon as the pain sense is lost. I know of three "anesthetic" deaths that have occurred in the course of one year in different New York maternity hospitals, which were undoubtedly due to acidotic shock.

In toxemia of pregnancy, especially in pernicious vomiting and eclampsia, there is an acidosis that in some instances is extreme and

may be represented by a CO_2 combining power as low as 16. The administration of an anesthetic to this type of patient increases the acidosis and death will ensue.

The emptying of the uterus in advanced toxemia is not to be considered until the normal degree of alkalinity has been restored by intravenous glucose injections and by the administration of bicarbonate of soda.

In addition to the acidosis the toxic factor must be considered in cases of pre-eclampsia and eclampsia. The toxins which produce these conditions also cause over-stimulation of the vasomotor center so that there is imperfect control and often following the delivery, a drop in blood-pressure of 100 millimeters of mercury occurs. This sudden lowering of the blood-pressure produces collapse. We see illustrations of this in delivery by version and breech extraction in pre-eclamptic patients with a high blood-pressure. There is such a rapid change in the intra-abdominal pressure that the woman bleeds into her own splanchnic vessels. These patients may come to the operating table in fair condition with a blood-pressure of 200 or more and after an easy operative procedure, suddenly become pulseless with a blood-pressure of 60 or lower. Death usually ensues in about half an hour. Although the fact has not been proved it is quite probable that all the abdominal venous channels are dilated.

Symptoms.—The symptoms of patients suffering from acidosis are characteristic. There is an increased respiratory activity and there may be acetone in the urine. They have a worried expression and an exhausted appearance, frequently they seem to foresee death; possibly fright has a contributory influence on the whole condition. Their lips are usually deep purple and very dry, showing dehydration. The patient may lapse into coma but until she is actually in shock there may be no change in the blood-pressure. Cannon has shown in cases of traumatic shock that with the reduction in the carbon dioxid combining power there is a coincident decrease in the blood-pressure.

Treatment.—The treatment of primary shock must be entirely prophylactic. In the first instance the carbon dioxid content of the blood must be increased before operative delivery is instituted. This may be accomplished by sugar injected by vein and the dehydration relieved by saline injected under the breasts. In the second instance the prophylaxis must deal with the prevention of the sudden lowering of the intra-abdominal pressure and this may be done by avoiding rapid delivery and by means of a Beck abdominal binder. The binder is

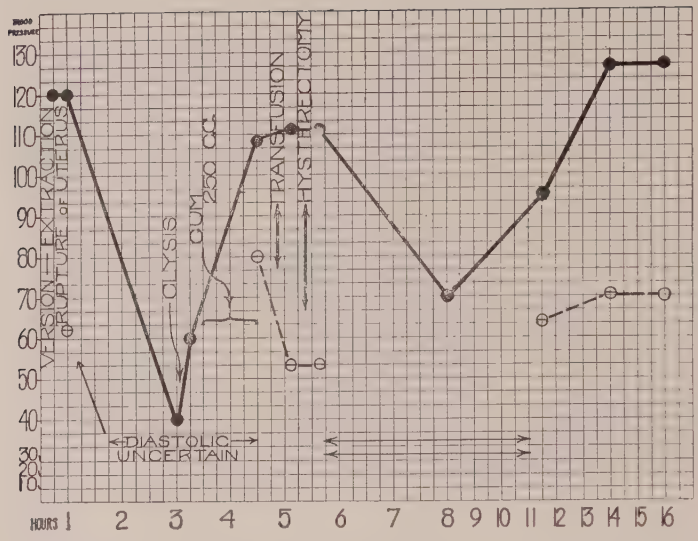


FIG. 36.—SECONDARY SHOCK. NO HEMORRHAGE. RUPTURED LOWER UTERINE SEGMENT. GUM GLUCOSE ADMINISTERED.

(Reprinted from the *American Journal of Obstetrics and Gynecology*, March, 1926)

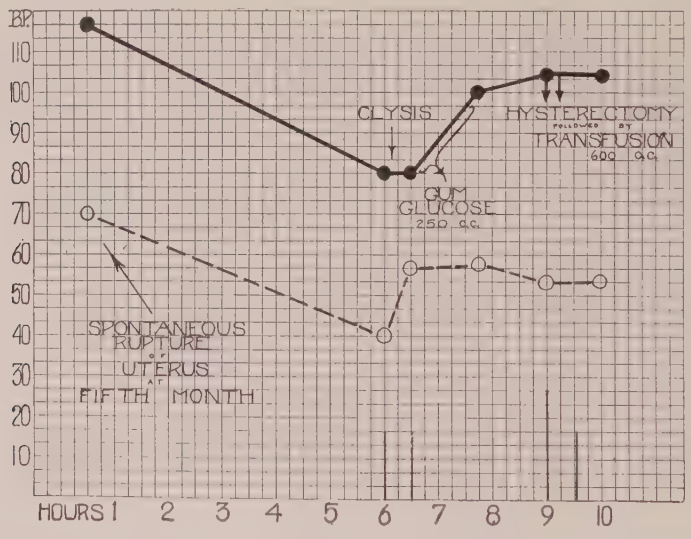


FIG. 37.—SECONDARY SHOCK. HEMORRHAGE. COMPLETE RUPTURE OF UTERUS WITH INTRAPERITONEAL HEMORRHAGE. GUM GLUCOSE ADMINISTRATION.

(Reprinted from the *American Journal of Obstetrics and Gynecology*, March, 1926)

tightened from time to time as the abdomen decreases in size until at the end of the labor it is absolutely tight and there is no dilatation of the weak abdominal walls. In addition it is sometimes advisable to place a sandbag on the abdomen.

Secondary Shock.—Secondary shock develops gradually and may be due to loss of blood such as occurs in placenta prævia and accidental hemorrhage cases or it may result from rupture involving the body of the uterus or ruptured ectopic pregnancies. It is also seen in cases

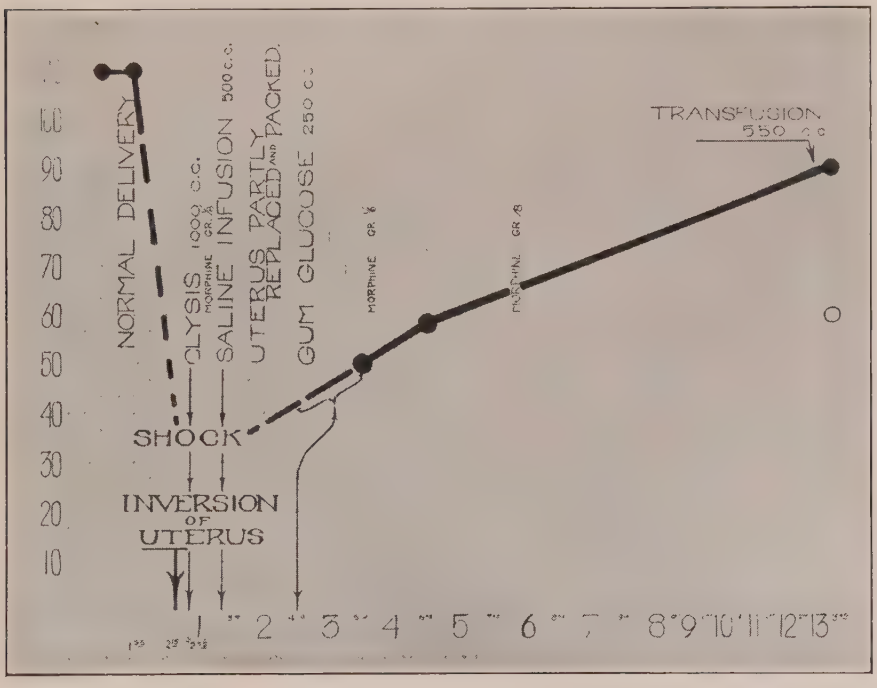


Fig. 38.—Primary Shock, Excessive Hemorrhage, Inversion of the Uterus. (Reprinted from the *American Journal of Obstetrics and Gynecology*, March, 1926)

in which there is a tear of the lower uterine segment extending but a few centimeters and accompanied by no external bleeding and with but a few hundred centimeters of blood in the layers of the broad ligament; or, again, in ectopic pregnancy with no great blood loss but with irritation of the peritoneum from a small hemorrhage. These are all typical cases of surgical shock.

Symptoms.—Immediately after the injury or blood loss the patient becomes pale and the skin cold and clammy. There is air hunger and thirst and there may be extreme depression, or the patient may become

excitable. Death does not follow at once. The blood-pressure drops gradually to 40 or below and during a period of one to three or four hours, the patient grows progressively worse, finally lapses into coma and dies.

Treatment—The essential part of the treatment of these cases of shock lies in the refilling of the vessels with blood by transfusion, or with some substitute, such as gum glucose, until a transfusion donor can be secured. In addition the standard form of treatment should be

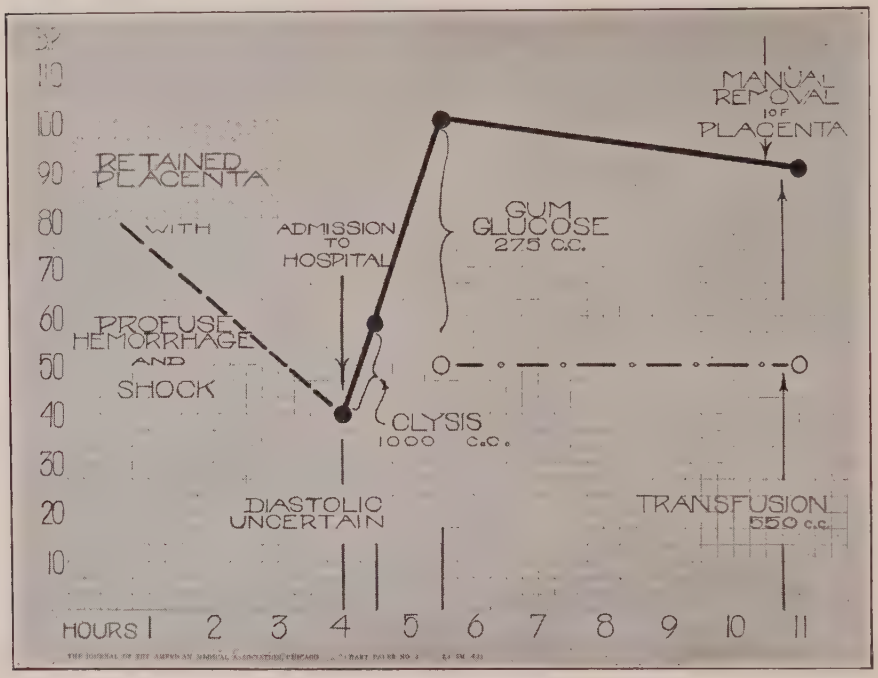

MANUAL REMOVAL OF PLACENTA
RETAINED PLACENTA WITH PROFUSE HEMORRHAGE AND SHOCK
ADMISSION TO HOSPITAL
GUM GLUCOSE 275 C.C.
CLYSIS 1000 C.C.
DIASTOLIC UNCERTAIN
TRANSFUSION 550 C.C.
HOURS 1 2 3 4 5 6 7 8 9 10 11

Fig. 39.—Secondary Shock, Postpartum Hemorrhage with Retained Placenta. (Reprinted from the *American Journal of Obstetrics and Gynecology*, March, 1926)

followed. The patient should be placed with the head lower than the rest of the body as in this position venous bleeding is much less likely to occur and there is a larger amount of blood sent to the brain and the medulla. Heat should be supplied by hot blankets and one-fourth of a grain of morphin given to control the nervous excitement. Warm tap water should be placed in the rectum in 6-ounce quantities. Hypodermoclysis of 500 cubic centimeters of saline should be given under either breast and gum glucose (6 per cent gum acacia and 20 per cent glucose) should be injected intravenously at a temperature of 104

degrees and at a rate of 4 cubic centimeters per minute. As soon as a universal donor can be secured 500 to 600 cubic centimeters of blood should be transfused. No operative procedure must be attempted until the blood-pressure has returned to 100 millimeters of mercury or more.

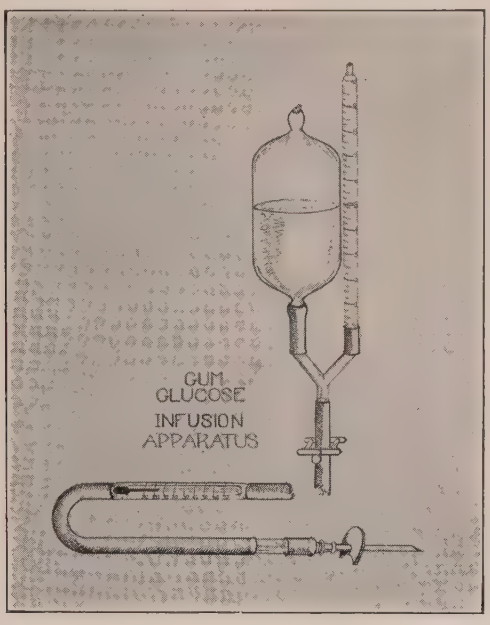


FIG. 40.—GUM GLUCOSE INFUSION APPARATUS DEVISED AT THE WOMAN'S HOSPITAL, NEW YORK.

By the use of the set screw it permits of delivery of the fluid at the rate of 4 cubic centimeters per minute. (Reprinted from the *American Journal of Obstetrics and Gynecology*, March, 1926)

The aseptic technic must be rigidly adhered to in all packing procedures as with the hemorrhage the patient has lost a certain amount of her immune or protective bodies.

BIBLIOGRAPHY

BAILEY, H., and DRISCOLL, W. P. Am. j. Obst. & Gynec., 1926, 11: No. 3.
HENDERSON, YANDELL. Am. J. Physiol., 1909, 24: No. 1.
CANNON, WALTER B. Traumatic Shock, Appleton.
FARRAR, LILIAN K. P. Surg., Gynec. & Obst., April, 1921, 328, 339.

CHAPTER VIII

EARLY NEONATAL MANAGEMENT AND NURSING

CARE OF THE INFANT

Little things count for much in the early hours of readjustment of the infant to an entirely new environment. The behavior, the cry, the few symptoms it shows, all are dependent upon the powerful transformation that takes place in its body as a result of its coming into the world. Let us recall that there occurs not only a more or less sudden expansion of the air vesicles of the lungs but a complete change, as well, in the circulation, particularly in the region of the heart and the liver. It does not take a great stretch of the imagination, to appreciate the ease with which some part of the complicated mechanism may go wrong. The human infant, being highly sensitive and delicately balanced, should be handled with the greatest gentleness at all times. If the appearance is abnormal and suggestive of injury, there should be little or no disturbance.

The room in which the baby is born should always be warm—very warm—and this is particularly true in breech deliveries.

If after the birth, both mother and child seem in good condition, one may wait a moment or two before clamping and tying the cord. On the other hand, if the mother is bleeding or if the infant does not appear just right, the cord should be tied at once. The writer firmly believes in the old method of holding the child up by its feet and spanking it lightly on the buttocks but not on the back. This must be done without vigor. The chief importance of holding the child by its feet is to allow mucus, liquor amnii, and blood to flow from the mouth and nose. It is surprising how often large quantities of these make their appearance. Certainly unless this step is taken, not infrequently the child cannot take a proper breath and moreover any effort at respiration is more than likely to aspirate at least a small amount into the bronchial tubes. A series of autopsies performed recently on babies that died at the Sloane Hospital for Women in the City of New York by Johnson has proved the serious-

ness of this preliminary inspiration, particularly in case there should be some antiseptic solution mixed with the other substances inspired. These autopsies showed clearly an inflammatory condition of the sensitive lung tissue.

After the cord has been tied off and the cord dressing put on, the eyes should be treated with either a 20 to 25 per cent solution of argyrol (or other similar preparation) or a 1 per cent solution of silver nitrate. When silver nitrate is used it should be followed by sterile salt solution or boric solution. All preparations must be fresh. The normal baby that has cried well, may now be put in its crib or basket on its right side, surrounded with blankets and unless the room is very warm with a hot water bag. This bag must not be too hot. The normal baby should cry easily at the start and from time to time thereafter. It will frequently open its eyes early and may start to make attempts at sucking. In case the child does not cry readily and gives the appearance of asphyxia, hot and cold tubs are of definite value. The pulmotor if carefully used will sometimes help, and oxygen may be of use. All violent methods of artificial respiration should be condemned. *The method, then, is activity but activity with restraint.* The writer does not believe in merely placing the child to one side and trusting to luck that it will eventually cry.

Abnormal signs are dependent chiefly upon (1) improper development of the heart or adjoining vessels, (2) injuries to the brain, (3) injury to the spine, particularly in the cervical region, (4) an enlarged thymus, (5) incomplete pressure on the cord, (6) an hemorrhagic tendency, and (7) too much anesthesia.

The physician does not have a great deal to guide him, in this earliest period of life, in making a correct diagnosis as to the type of abnormality. Please do not forget this, and bear in mind that any cause that gives rise to cerebral congestion may simulate cerebral hemorrhage. Time after time such a diagnosis is made when it does not exist and all we find is either edema of the brain or a slight degree of congestion. The manifestations of departure from the normal are chiefly (*a*) the ordinary signs of asphyxia; (*b*) languor after apparent recovery, or irritability manifesting itself by more or less continuous whining; (*c*) blueness of the body which may appear early or not for several hours and this color becomes darker rather than lighter when the baby is made to cry, in case the condition is due to a congenital lesion of either the heart or one of the blood

vessels around the heart, and (*d*) symptoms of enlarged thymus which sometimes appear early or not for 12 or 24 hours or even more and which consist either in a tendency to sudden catching of the breath with a slight spasm of the body and cyanosis or sudden death without warning.

In a recent thymus case of the writer's, the head and face were entirely blue from the pressure of the thymus on the vessels of the neck and the rest of the body pink or red. At times with an enlarged thymus, it is noticed that the baby gasps for breath and becomes cyanotic when on its back and that this disappears when turned on the side.

In cases that give fairly accurate suspicion of cerebral hemorrhage a spinal puncture may be of definite value. Direct operation on the brain is not highly encouraging. In case the thymus is suspected it is important to get an x-ray picture at an early hour. This will show definitely whether or not there is any enlargement. If there is, three exposures by one who is familiar with the technic, is said to practically cure the condition. These are usually of three minutes' duration and are given at an interval of from five to seven days.

Idiopathic Hemorrhagic Tendency in the Newborn.—In some the signs of hemorrhage are external, in others entirely visceral; in the majority of instances both varieties are combined. The amount varies considerably.

The bleeding is seen most commonly from the cord, the intestine, and in the subcutaneous tissues. It is now believed that cerebral hemorrhage develops readily in cases with this hemorrhagic tendency, even though the labor itself is not a difficult one; also, this tendency is unquestionably increased by prematurity. We cannot speak positively of the effect of syphilis upon this condition.

Etiology.—The etiology is still uncertain. There seems to be in many a prolongation of the blood-clotting time. Heredity certainly plays a strong part in the true hemophylic cases, but we have not determined the exact relationship thereof to congenital conditions during pregnancy.

At birth, the infant's red blood cells number between six million and six and a half million. During the first ten days there is a marked destruction of these. There is a definite change in the circulation in the liver and very often a chilling of the skin of the newborn due to a cold room. These are all factors which play a part in the manifestation of hemorrhage.

Treatment.—If the mother has a hemophylic tendency, or is in poor health, it is a wise plan to give calcium in some form during the last four to six weeks of the pregnancy, for its effect upon the blood of the infant as well as to improve the structure of the cranial bones; well-developed cranial bones being more likely to protect the brain in labor than when there is a definite deficiency in lime salts. A family history of hemophylia is an indication to give the infant some whole blood subcutaneously as a prophylactic, even though there may be no symptom.

In cases with undoubted symptoms, or where haste is demanded, the blood may be given directly into one of the veins of the infant. The blood may be given by the "citrate method" or directly from donor, by means of the syringe technic. A small amount, 30 to 60 cubic centimeters, is given through the external jugular vein or through one of the veins of the scalp. It must be given slowly. Results are most satisfactory excepting in the bad cases of brain hemorrhage. The baby must, of course, be kept absolutely at rest and very warm.

A simpler method is to inject 20 to 30 cubic centimeters beneath the skin of the back. This can be repeated, as required. Either whole blood or serum is used.

The further handling of the complications of the newborn will be taken up in the volumes by Grulee.

NURSING

One of the ideal results of prenatal care should be that the mother *is* able to nurse her baby.[1]

She has been prepared both physically and mentally for lactation. A mother who does not *want* to nurse her baby is rare (at least in this country) no matter what her station or her duties in life. It is her natural instinct to want to do this, partly because she feels it her duty, partly because the act itself is one of love. It is the responsibility of the obstetrician [1] to help his patient accomplish this. He can best bring this about by thorough instruction of the mother in the advantages of and the means of accomplishing breast feeding.

His difficulty will not be so much with the will of the mother as with her environment. Life to-day is keyed to such a pitch, and

[1] This volume is a treatise on prenatal care and heredity. Should the subject of nursing be considered? The authors think that it should.

The editor of the series also thinks that the viewpoint of an obstetrician on the subject of breast feeding will prove of value in this series in as much as another presentation of the same subject (in another volume) is the pediatrician's viewpoint.

the complexities are so many, that the fulfillment of most normal functions is rendered more difficult than it should be. It seems to take, at least for the city dweller, all the surplus nervous energy and bodily strength to adjust oneself to the relentless speed and irritable hurry, late hours, and nervous worries.

The patient should be made to realize that breast feeding is the basis of health and good nutrition for her baby; also that the death-rate of breast-fed infants is much lower than that of bottle-fed infants and that the breast-fed infant is also less susceptible to contagious diseases, less prone to develop rickets and scurvy. Modern dentistry even teaches that breast milk favors the development of good teeth.

The patient should learn, too, that in the first month postpartum, nursing in the average case is beneficial to herself. Furthermore, it is easier to nurse the baby. Bottle feeding to be safe requires constant painstaking care. The mother must be assured of the purity of the milk; it must be properly prepared for the baby's use and adapted to the baby's changing needs. All the utensils used in its preparation must be kept clean; the nipples and bottles sterilized. If the formula for some reason does not agree with the baby, experiments must be tried out until the right formula is found. In the meanwhile the baby's growth, functions and general development can be appreciably retarded.

The mother's interest in the process of milk formation should be aroused. She will then be more alert to follow directions, more eager to coöperate. Her understanding of the whys and wherefores will inspire her to do her duty as a mother. She should be instructed in the physiological action of the mammary glands. It should be clearly understood that the mammary gland is a laboratory for the purpose of making milk from the elements it receives from the blood. Here the point can be made of a balanced diet, proper exercise, rest, and other hygienic measures.

Exercise for both the prospective and actual mother is essential. Walking in the open air causes deep breathing, develops the abdominal muscles, and assists in elimination. Pleasant open-air occupations increase her physical well-being.

The patient's environment during the period of gestation, the lying-in and nursing periods, assumes an important rôle in her ability to nurse. Pain, anxiety, and worry interfere with the secretion of milk. Her family, friends, and doctor should see that the surroundings are pleasant. Courage and morale must be kept up.

Extreme exhaustion at labor has a direct influence upon the secretion of both quantity and quality of milk. If the patient's convalescence is retarded, her ability to nurse will be definitely lessened, and the quality of the milk will be inferior.

The patient should be shown that toxic conditions—the toxins of fatigue, worry, etc.—interfere either partially or completely with nursing.

The patient should be instructed several weeks previous to her delivery to apply a lubricant to the nipples and to roll them gently between the thumb and fingers to secure pliability. This, too, will help to make the nipples more prominent. Sterile vaselin, sterile lanolin, or cocoa butter are very satisfactory. Throughout the entire pregnancy, the breast and nipples should be kept scrupulously clean with some simple, pure soap. Depressed nipples are treated regularly in this way or they are drawn out by means of the gentle use of the breast-pump. Occasionally no treatment is efficacious in relieving the bad cases.

The responsibility of the obstetrician during the prenatal period is, therefore, to prepare his patient to nurse her baby by means of diet, exercise, general physical care, and mental encouragement.

The obstetrical supervision of the infant may then be divided into three periods: (1) prenatal instruction which we have just indicated, (2) the lying-in period, and (3) the early weeks of life.

While there may be unanimity of opinion about the superiority of breast over bottle feeding, there are wide differences in practice when it comes to feeding the individual baby. The majority of pediatricians and a large group of obstetricians seem to believe that at least 90 per cent of mothers can nurse, if they so wish and if they are properly looked after. Many of these physicians believe that there is a definite technic in breast feeding, and they teach that practically all breast milk is good and advise continuing the nursing, even if there can only be but two nursings in 24 hours, for the possible good it may do the child.

With this extreme point of view the writer disagrees. Certain women have poor milk just as certain cows have poor milk; and good milk from a cow, whether in the fresh state or in powdered form, is better than poor milk from the mother. Believing this, however, does not affect the general proposition that nursing should be carried out when possible and that satisfactory nursing is possible, at least for a while, in the majority of women.

The principle of successful lactation rests upon certain definite factors:

1. The mother's conviction that she can nurse her baby, with the help and the guidance of her physician.

2. Periodic stimulation of the breast by the infant at intervals of three or four hours.

3. Complete emptying of breasts by the infant at these nursing periods. If the infant cannot empty them, the mother can be taught a simple, painless and effective method of manual expression; or, in certain cases, the breast-pump may be of value.

4. If the breast milk is insufficient, complementary feedings must be provided for the infant at the end of every breast feeding. The amount of this feeding should depend upon the amount of breast milk secreted. When this is adequate the complementary feeding will be no longer necessary.

The mother's milk does not secrete for from 48 to 72 hours after the birth of the child. The baby as a rule needs little during the first 24 to 36 hours. It should be given slightly warmed water, or 5 per cent sugar solution or whey every 4 hours, until the mother can supply the needed quantity. When the mother has somewhat recovered from the fatigue of labor, perhaps 8 hours later, the baby should be put to the breast, and again every 6 hours, until the breasts are distended or until free secretion of milk begins.

The principal value of this early nursing is the training it gives both the mother and the baby in the habit of nursing. In addition, the nursing helps the uterus to contract and the colostrum apparently serves as a laxative to the child.

After the milk appears, there may be an oversupply for a few days and, with this excess comes much discomfort. Fluids should be temporarily restricted. A saline purge can well be given for one or two mornings. A breast binder gives comfort. In the early stage of engorgement, the writer favors an ice-bag. Relief will further be facilitated by manual expression, by the breast-pump or a second baby. This condition is soon adjusted.

Adequate sleep and rest are essential for the production of an adequate supply of breast milk. Her night's rest should be supplemented by a *daily nap*. In certain cases the 2 A.M. feeding should be avoided and a bottle given, to enable the mother to obtain more sleep.

Cleanliness in the care of the nipples is an important aid in the

carrying on of breast feeding. They should be washed with boric acid or clean water or a solution of witch-hazel after each nursing and thoroughly dried and then covered with sterile vaselin or lanolin. The baby's efforts to nurse may cause the nipples to crack. Cracked nipples are also caused by allowing the baby to nurse too long at a time. A mixture of bismuth in castor oil with squares of ordinary waxed paper or of old soft linen (baked) to protect the nipples from being rubbed by the clothes, makes a satisfactory application for sore nipples. Compound tincture of benzoin is also satisfactory. In the intervals between the nursing, lead nipple shields may be temporarily useful. These must be scalded before use and, when employed, more than the usual care is needed in washing the nipples before nursing. Lead poisoning has been known to occur after prolonged use. A nipple shield either of rubber or of glass for the nursing will often help until the abrasions are healed. The crack will heal promptly if touched with a silver nitrate stick. If the baby's mouth comes in contact with the sore nipple, it may become infected. It may be necessary to spare the nipples by having brief nursings for a time. In this case, care must be taken to empty the breasts thoroughly and to increase the complementary feedings.

In the course of the weeks, the quantity and quality of mother's milk in the breast are subject to considerable fluctuation and are, at the same time, susceptible to certain modification.

If a decided decrease should occur in the amount of milk secreted, strenuous effort should be made to overcome this both by local and general measures. Manual emptying of the breasts (to be explained below) or the electric breast-pump will help a great deal. A fair trial of both methods should be given, before removing the baby from the breast.

To increase further the quantity of breast milk, if there is an insufficient amount, the infant should nurse both breasts at each feeding. The mother should increase the amount of her fluid diet, and finally she should have more sleep and rest, as well as a moderate amount of exercise. Milk and cereals are particularly useful.

The quantity of the breast milk may be lessened by limiting the amount of her fluid diet, by binding the breasts, and by purgation.

The vitamin content of the mother's diet influences the vitamins in her milk. The quality of the milk is improved by the free use of milk, cream, butter, eggs, peas, beans, lentils, meat, and cereals. Fruits that are only mildly acid are beneficial.

Solids in breast milk are increased by shortening the intervals between nursings. They are diminished by lengthening the intervals, especially by substituting or skipping a breast feeding.

Nervous tension, overexertion, and fatigue tend to increase the protein and sugar of breast milk (particularly the sugars). The removal of worry and limited exertion increase the fats.

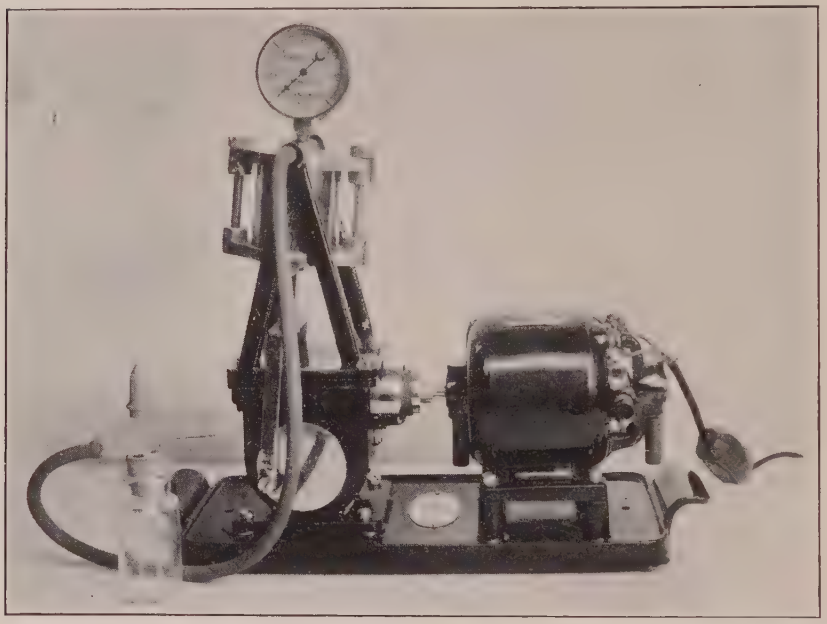


FIG. 41.—ELECTRIC BREAST-PUMP. (I. A. Abt)
This pump is driven by an electric reciprocating mechanism. The suction is intermittent and the degree thereof is regulated by means of a gauge.

Breast-milk examinations are frequently made but in many cases, these are very unsatisfactory. This is due:

1. To the difficulty of securing the entire output of each breast.

2. To the fact that the composition of breast milk may vary greatly in the same woman not only from day to day but even from nursing to nursing. At times the ratio varies in the two breasts.

3. To the not uncommon experience of finding that a child is satisfied with and thriving on a breast milk which from a laboratory standpoint is all wrong; so also may laboratory report show a classically correct chemical composition in the case of breast milk which causes colic, flatulence, and other digestive disturbances in the child.

"The child is the best laboratory for testing his mother's milk."

In the presence of doubt regarding the sufficiency of the milk, the infant should be weighed before and after each nursing for 24 hours' time to determine the quantity of breast milk. This procedure may be nerve-racking to a sensitive mother. The weighing tests may show a sufficient quantity of milk, and the baby may seem satisfied, but if it wakes soon afterward, with the typical "hunger" cry, the quality of the milk should be questioned.

If the mother's milk is too high in sugar, the baby will usually manifest colic and there will develop very soon, frequent green fermentative stools with excoriation of the buttocks. This condition is in my experience very often associated with an abundant milk supply but of poor quality or is seen in those cases in which the milk is continually leaking away.

To correct the trouble an ounce of the first milk, if the milk supply is abundant, may be expressed and an ounce of barley water given before the nursing. If it is scanty and the stools are watery and green, complementary feedings should be given with a relatively high protein percentage and little or no sugar. Eiweiss milk or buttermilk will be useful for a while.

This plan is not always safe, however, and the writer is compelled to state that there are babies that cannot stand this temporizing and will die if not taken off the breasts.

Evidences of fat indigestion are vomiting, sour eructations with the rancid odor of fat, and yellow glistening stools. The mother should drink more water, eat less abundantly, and exercise more. In case complementary feedings are given they should be low in fat and high in protein, such as skimmed milk or calcium caseinate mixtures. If the stools show undigested fat the infant should be taken from the breast just before its complete emptying, as the last milk being the richest in cream is left in the breast and should be manually expressed.

Care, then, must be taken to neutralize or offset the shortcomings of breast milk. The baby's symptoms, just as in the case of bottle feeding, must be the guide.

No baby needs to be taken from the breast because its mother's milk is not entirely suitable and breast milk may be corrected or modified in the mother's breast or in the child's stomach to a certain extent, but results are not obtained as readily as in bottle feeding.

To sum up the methods of sustaining and regulating the supply of breast milk and its modifications:

(*a*) Breast milk is the most desirable food for the infant and the milk of the average normal mother will agree with the average normal baby.

(*b*) Breast milk may be modified as to quantity and quality and composition in the mother's breast and in composition in the infant's stomach by complementary feeding. This modification is not as *exact* as in ordinary modified milk feeding.

(*c*) The infant's stools must be the guide for the exact nature of the complementary feedings.

(*d*) Laboratory tests of breast milk are not satisfactory guides in deciding the question of weaning a breast-fed infant.

Complementary feeding is the supplying of a varying amount of artificial feeding to supplement scant or unsatisfactory breast milk. The most generally employed modifications are simple pasteurized or boiled milk dilutions, with dextrimaltose or lactose added, if a sugar is needed. One of the "dried milk" preparations on the market, is often invaluable. In fact many splendid results are achieved by the use of "dried milk." A number of obstetricians and pediatrists have for several years, started most of their babies, demanding supplementary or entire feedings, on such milk. It is well to remember that in beginning either dried milk, boiled or pasteurized milk early, and continuing for a long time, one should add cod-liver oil to each bottle, as a prophylactic measure. We now begin as early as the third or fourth week with one drop in each bottle and gradually increase to ten or twenty. The "dried milk" must be made up carefully before each feeding. The container must be kept tightly sealed and out of the heat. Increases should be made slowly.

When using fresh milk, that obtained from Jersey cows is not particularly desirable. If used, the top fat should first be removed.

Method of Manual Expression.—"Scrub the hands thoroughly with nail brush and warm water and soap. Care should be taken that the nipple is clean. Apply the ball of the thumb and the ball of the index finger to opposite sides of the breast, upon or just behind the pigmented areola; then approximate them, at the same time pulling the nipple forward and outward. In other words, a manipulation is employed similar to that used in ordinary milking, but substituting the thumb and finger for the grasp of the whole hand. In both cases, pressure is made upon the reservoir into which the milk ducts empty;

and in both cases this pressure will produce a stream of milk of considerable length. This procedure should be repeated rhythmically, at a rate of speed that is comfortable and not too tiring, until all the milk has been expressed. The milk may be caught in a wine glass which has previously been boiled. The nipple is not to be touched. The mother uses the right hand to empty the left breast; and vice versa. If instead of expressing the milk into a sterile glass after the baby has taken as much as he will, the mother carries on the manipulation during the nursing, while he is at the breast, thus emptying the milk directly into the baby's mouth, and stomach, the complementary feeding may not be needed. Nothing will make a sluggish, lazy baby start nursing so effectively as thus milking a mouthful into his throat. It does not necessarily awaken him. Remember that often the best nursing is done while the baby seems to be asleep at the breast." [2]

Mastitis.—The greater the care and cleanliness given the breasts, the fewer will be the cases of mastitis. Mastitis may be suppurative or non-suppurative. It appears at any time during the nursing period, but is most commonly seen between the eighth and twenty-first days.

There is local tenderness, pain, increased local heat, and a mass of variable size in one quadrant of one breast. There is a rather sharp temperature reaction in the majority of cases. In over one-half of the cases at least, the attack follows a tender and cracked nipple or some slight trauma to the gland tissue from too vigorous or too prolonged nursing or from injury due to rigorous massage or to the faulty use of the breast-pump.

At the onset the treatment should be:

An ice-bag to the affected part
Dry diet
Saline catharsis

Nursing should be continued unless it is too painful. The breast-pump may be considered, but *must be used* with extreme caution.

A few small doses of aspirin or some other sedative will add much to the patient's comfort.

If the temperature remains high at the end of 48 to 72 hours it will be found that pus has probably developed, thus changing the simple variety into the suppurative type. If suppuration is suspected, one or more small incisions should be made at the most dependent part

[2] This is the procedure of Sedgewick, Richardson, etc., and the procedure is described in their language.

and the abscess cavity treated according to regular surgical principles. Nursing should be stopped temporarily in all but the simplest cases. If this is not done, the baby can readily become upset and may swallow milk contaminated with pus. The milk may be kept from disappearing by means of the judicious use of the breast-pump—preferably the electric pump.

BIBLIOGRAPHY

Johnson, W. C. Am. J. Obst., 1925, 9.

CHAPTER IX

PRENATAL CARE FROM THE PUBLIC HEALTH STANDPOINT

Prenatal care from the public health standpoint is primarily educational in character. It teaches the importance of *early care* and of *early* reporting to either doctor or nurse, the onset of any unusual symptoms; the purpose and value of urinary analysis; the danger signs of pregnancy, such as severe headache, disturbance of vision, swelling of feet or hands, abdominal cramps, bleeding, etc.

The patient should learn too, before the birth of the child the first lessons in the care of the newborn, and the great importance of maternal nursing. One of the promising features of this educational training is the fact, that the more each patient learns during her pregnancy about herself and the child she is carrying, the more careful she will become and the more likely she will be to *demand good care at the time of delivery.*

Prenatal care really means not so-called antepartum care alone, but care up to the time of the actual birth of the child; furthermore, according to the generally accepted usage at the present time, we should include also the care during the early neonatal period.

To merely give watchful care and repeated advice during pregnancy and then allow the patient to be delivered by an inexperienced or careless physician, or by an ignorant or dirty midwife, is really only attacking one phase of a great problem.

Meddlesome midwifery, whether on the part of midwife or doctor is dangerous and abnormalities should, so far as possible, only be cared for by the trained obstetrician. Just as it is difficult to accurately gauge the relative importance of heredity as against environment, so is it likewise difficult at times to differentiate between the number of deaths of infants definitely depending upon *antenatal causes or upon labor itself,* as in many instances both have a share. The very best possible supervision should be given throughout the entire obstetrical period.

Prenatal care, as can readily be seen from a considerable num-

ber of accurate statistics already gathered, can accomplish a great deal, especially in diminishing the number of cases of toxemia, bleeding, syphilitic infections and prematurity, but it cannot in itself do away with the mortality and invalidism due to bad obstetrics. The dangers of labor to both mother and child are *real dangers.* The effects of bad obstetrics have not been exaggerated by the sentimentalist and propagandist.

During labor, the greatest dangers to the mother are from hemorrhage and shock. Sepsis and invalidism often follow and are usually the result of ignorance and neglect. To the child, the most common dangers are those of cerebral hemorrhage, spinal injury and pressure on the umbilical cord.

In order, from the public health aspect, to safeguard mother and child throughout the whole period of childbirth, there is great need for the following changes in our methods.

PROTECTION OF MOTHER AND CHILD

Need of Improvement in Medical Care.—First and foremost is *the need for improvement in medical care.* Medical teaching in our undergraduate medical schools (there are fortunately a few exceptions) has so far failed to assign enough importance to the branches of obstetrics and gynecology, and has failed to realize the real relationship of obstetrics to the community.

The necessity for thorough clinical work in this line is either not sufficiently appreciated, or, if appreciated, cannot be carried out because of poor clinical facilities. Theoretical teaching on the whole is good, but the practical aspects need far more attention. The state requirements have been too lax. As a result, the student is usually given the minimum amount of practical work and the minimum amount of time in either hospital wards or dispensaries. Efforts are, to be sure, made by a number of states to improve conditions of practice by adopting those standards presented by the Standardization Committee of the American Medical Association; that is, each student must have witnessed at least twelve confinements and must have had charge of at least three of these.

Another great reason for the poor quality of obstetrics practiced in the country as a whole, is the fact that so little opportunity is available in any part of the country for obtaining really good, practical postgraduate experience. Conditions can never be as satisfactory

as they should be, even with improvement in theoretical lines, until such postgraduate experience can be obtained by physicians.

Upon graduating from a medical school, or even from a hospital where obstetrical cases are only "occasionally" handled, the physician should realize that he is not a *specialist,* and that obstetrical complications are prone to be serious in nature and demand the assistance of a specialist, providing such help can be obtained. Unfortunately, childbearing has been so taken for granted, even by the great mass of physicians, that it has been considered possible for almost any doctor to carry such patients through the most trying experiences of their lives. The risks taken are almost unbelievable; while much of the work is of lowest grade.

The physician must always bear in mind that he has two lives to safeguard. This responsibility is rendered more trying by the fact that the great majority of women must still be delivered in the home and with but few facilities.

The real difficulties of the situation would seem, then, to be due (1) to the fact that of those cases delivered by physicians, the greatest number are of necessity delivered by general practitioners who have not had the time or the opportunity to enjoy special training in obstetrics; (2) to the fact that the work is particularly trying, owing to the responsibility, the long hours, and the generally poor remuneration; and (3) to the scarcity of maternity institutions and of public health nurses.

Position of the Midwife.—Second, there should be a revaluation of the midwife. In every discussion on the care of expectant mothers, from the standpoint of public health, the midwife question must be faced and cannot be brushed aside as unworthy of consideration, for it is really one of great importance. The midwife is still an economic necessity and is likely to be for years to come in many sections of the country. This fact might as well be accepted by the physicians who deplore her existence. *For she is here,* and she is here to stay until some other method is devised for handling the many thousands of cases which either cannot have the care of a physician or who are not willing to have it. So much misinformation exists regarding the number of midwives in this country that the Federal Children's Bureau, sometime ago, sent out a questionnaire to the various states, asking how many midwives were authorized to practice; how many others it was estimated there were; the percentage of births tended by midwives, and what was being done to teach and supervise them.

"Information secured through this questionnaire showed that it was estimated that 45,000 midwives were practicing in the 41 states from which information was secured and that this number was probably below the actual total. The percentage of births attended by midwives in some states was large. In two of the southern states almost half of the births were so attended. In other southern or near-southern states the percentages ranged from 16 to 38. Nor were the southern states alone in showing large percentages. New Jersey reported 27 per cent; Connecticut 16; New York, exclusive of New York City, 11; Arizona 12; Wisconsin 10 per cent.

"Many of the states are awake to the dangers of the situation and are making state-wide or county surveys; are appointing inspectors or instructors of midwives; are enforcing registration, holding classes, inspecting equipment, and educating the mothers to demand safe care and clean methods. Other states which know less about their midwife situation are trying to discover how many women go to hospitals, how many have midwives, how many have no expert care at all. The result of these surveys has been, in many cases, to stimulate hospital provision in small towns."

The emphasis in nearly all states which have a midwife problem has been *on improving the quality* of the midwife's service rather than eliminating her. Eventually it might be desirable, of course, to refuse to permit any one but a thoroughly qualified physician to assist mothers at birth. At present such a course would seem impossible. Here is a state, for instance, whose director writes that "there are many large rural communities that lie at a distance of 50 to 100 miles from any doctor so that lay-help in time of childbirth is absolutely imperative." [1]

The midwife, however, should never be permitted to practice unless licensed and properly supervised. Unfortunately this requirement does not exist except in certain favored communities in this country. In a few states, she is not only *licensed* but quite effectively *supervised;* in other states, she is utterly ignored although the authorities are well aware that she is practicing; and finally, in still other states, she is allowed to practice in dirty fashion with merely a minimum of supervision.

The state authorities, in the writer's opinion, should either rule her out entirely or license her and effectively supervise her. Only those who can show reasonable competency, a proper respect for

[1] Watters, *Journal of the American Child Health Association,* 1924.

cleanliness and authority should be allowed to practice. The fact is that physicians alone cannot handle, at the present time, the great number of births that are taking place unless some one can devise a complete change in the whole system of management. It is useless to *deny* that in cities, and in states where the standards of licensure are high, and where the supervision is carefully carried out, that results of the midwives are fully as good or even better than those of the general practitioner working in the same community.

In a study carried on by Julius Levy of the Bureau of Child Hygiene of Newark, New Jersey, and reported by him in February, 1923, in the *American Journal of Public Health,* the comparative responsibility of physicians and midwives in regard to maternal mortality has been carefully discussed. He shows that in the fifteen largest cities, excepting only Pittsburgh, there has been a decrease in the number of cases reported by midwives, and of midwives reporting cases; but there has been not only no decrease but rather an actual rise in maternal mortality, and that the centers having the lowest percentage of midwives have the highest percentage of maternal deaths. This last statement, of course, applies to these particular cities and not necessarily to the country at large.

In those counties in the state of Indiana where, according to A. N. Mendenhall, one-half of the women are delivered by midwives, the maternal and fetal deaths are considerably better than in the state as a whole. Especially is this true in regard to sepsis. The results in New York City and New York State are well known and the views of both the local Department of Health, as well as those of the State Department of Health coincide closely with those of Levy of Newark. *The ignorant, unsupervised midwife is unquestionably a source of tremendous danger to any community.*

According to George C. Mosher of Kansas City: "The rapid decrease in the number of midwives in practice; the more drastic supervision by Departments of Health over them in many sections of the country; the realization that their work among that part of the population whom they serve, shows no higher percentage of bad results than the general average of the community; these considerations eliminate the midwife as a factor to be reckoned with in the solution of the continued high rate of maternal mortality."

Is it not true, then, that the only way that progress can be made, is for the physicians themselves to realize that there *may be* some just reason for this recent agitation regarding the generally

prevailing low standards in maternity work, and for them to devise some plan that may be more appealing to the better type of younger physician, so that more of these will take up this branch of medicine and practice it with as much enthusiasm as the average young surgeon enters the surgical field.

In prenatal public health work the midwife is rather a difficult factor to deal with but her confidence should be secured because of the fact that her cases, as a rule, receive *no* attention during pregnancy. The midwife is naturally suspicious of the public health nurse and for the most part is still convinced that both the prenatal clinic and the nurse are scheming to take away her patients. The midwife should be required by law, it would seem to the writer, to bring every case that she is to handle, at least *once* to either a health board prenatal clinic, or to a maternity center clinic, or to a hospital clinic, in order that each case may be passed on by a competent physician. If none of these clinics are available, then each midwife should be required to have every expectant mother seen for the same purpose by a private physician.

This is very difficult to bring about and yet it certainly would seem to be most desirable. The midwife should be allowed to care for only normal cases, and all abnormal cases should at once be placed in charge of a competent physician, when one can be found. As in the case of the inexperienced medical man, abnormal cases should be taken to the hospital, when such hospital is available.

The surest way to eliminate the midwife, granting that such elimination may be desirable in time, is to be continually raising the standards demanded of her. She may some day be totally eliminated, but to attempt to bring this about at the present time, particularly in large, foreign communities, would accomplish but little good and would unquestionably add greatly to the discomforts and sufferings of the poor women amongst whom they practice. The only methods by which such "midwife patients" can be protected, if the midwife as we understand her to-day, is eliminated, are (1) by increasing the outdoor services of obstetrical hospitals; (2) by giving certain nurses a special training in *practical midwifery;* and (3) by developing *voluntary community health protection* and group medicine.

Position of the Hospital, Lay Organization, and Nurse.—The *third factor* in the public health aspect of maternity protection is the group which includes the hospital, lay organizations interested in maternity welfare, and the nurses. All three are essential for com-

plete supervision and protection of the expectant mother during pregnancy, during labor, and during the puerperal period.

Three classes of nurses are brought into play in every thorough scheme of this character with anything like wide ramifications. There is, first, the nurse in the hospital. She may at times be all that is necessary. Second, there is the municipal or district nurse, and third, the nurse supported by lay organizations.

In as much as the economic situation is of such vital importance to the family and in as much as illness of any kind brings with it great additional burdens upon the poor, and not infrequently disrupts the family either temporarily or permanently, particularly when the father or mother is obliged to have hospital treatment, the *social service worker,* or the *mother's helper,* is of *vital importance.*

Great possibilities are in store for those who apply themselves to the problems of prenatal care, but it will call for patience, enthusiasm and tact.

"The time is ripe for such effort; for deaths from congenital diseases and from conditions arising during childbirth are far too common and are always particularly sad!"

In any maternity program, the coöperation of the private physician and county medical society, in a given locality, should be first sought. When once this coöperation has been obtained, it is not a difficult matter to bring hospitals and lay organizations interested in public health, into line.

A necessary feature in the development of such a plan is for those who are directing it to avail themselves of existing organizations as far as possible, and thus *endeavor to simplify and coördinate* rather than, through reduplication of effort, to place a new burden upon the community.

The following comprehensive plan for an intensive campaign for a city with hospitals and charitable organizations, has been suggested by Jacob Sobel of the New York City Department of Health. This plan is the "ideal goal" to strive for.

"1. Zoning or districting the city for instruction and follow-up work by nurses or social workers, in the homes of mothers, during the period of pregnancy, and for as long thereafter as necessary or possible, preferably one year.

"2. So far as is possible maternity institutions should follow their own cases in the home and should take upon themselves the burden of their particular districts. In the absence of such facilities,

these institutions should endeavor to have all prospective mothers visited by a district nurse.

"3. Referring all mothers and babies discharged from maternity institutions to either their own pediatric clinic or to baby health stations.

"4. Coöperation of private physicians in availing themselves of the services of the nurses doing prenatal work so that mothers under their supervision may be instructed in the hygiene of pregnancy and referred to them in the event of untoward signs and symptoms. Settlements, neighborhood guilds, churches, and day nurseries should refer to the prenatal clinics all expectant mothers coming to their notice.

"5. An educational campaign of instruction for expectant fathers in order to arouse them to their duty and responsibility toward the mother and the future offspring.

"6. Increased interest and coöperation of philanthropic organizations and individuals in the establishment of a *prenatal clinic* within prescribed districts and in furnishing to worthy mothers necessary material aid in the form of food, clothing, aftercare, baby outfits, and obstetrical outfits. Increased appropriation, too, by city authorities for the appointment of an augmented corps of nurses for instruction and supervision of expectant mothers, not so much with a view to reaching all the prospective mothers—for that is well-nigh impossible—but to act as a wedge, by educational propaganda, into the inertia which now exists as to the urgency and importance of this problem.

"7. A municipal or philanthropic employment organization for securing work for unemployed expectant fathers so as to reduce to the lowest possible minimum the gainful occupation of the mother before or shortly after delivery; this to act as a substitute until the possible passage of a health insurance bill, which includes maternity insurance.

"8. Enactment of legislation prohibiting the employment of pregnant women in factories or manufacturing or mercantile establishments, for a period of four weeks prior to, and at least four weeks after delivery, with provision for weekly stipends and care during this period, or, as a possible substitute, the establishment of day nurseries in or adjacent to factories, in charge of trained nurses, where mothers may nurse their babies, or where properly regulated artificial feeding can be maintained. This has been done in France, Russia, and Italy; why not here? This will increase maternal nursing, decrease deaths during the first month of life, and do away, to a great extent, with

the prevalent custom of leaving these infants in charge of old 'mammies' and irresponsible neighbors.

"9. Provision for improved and increased obstetrical care in homes and institutions for those able to pay only a moderate fee or unable to pay at all. This presupposes greater and better outdoor maternity service, and a larger number of properly-equipped maternity institutions throughout the city. If the public could be taught that such service might be obtained, the midwife problem and the meddlesome accoucheur would adjust themselves, and hospitalization for delivery would become popular.

"10. The application of an excessive supply of breast milk for the use of premature and delicate infants within the maternity institutions, or in the neighborhood, rather than the sale of the same for the babies of the better classes, who can have other advantages, such as wet nurses, trained nurses, good surroundings, personal attention, proper clothing, etc., that money can buy, and who can better be tided over a dangerous period than those of the poor.

"11. Education of the public to the importance of having mothers who give birth to stillborn infants or who lose their children during the first year of life, act as wet nurses to the worthy poor. Publicity should be given this subject, and these mothers should be urged to register voluntarily with the Department of Health.

"12. Persistent education as to the care of the breasts and the importance of maternal nursing, as the remedy par excellence in the reduction of infant morbidity and mortality, especially during the first month of life. The danger of artificial feeding should be emphasized and 'back to the breast' should be the slogan.

"13. Provision for an increased number of temporary shelters, where mothers about to be delivered in institutions may place their infants and children during the period of confinement, and thus secure that peace of mind and contentment which is essential for the prospective mother.

"14. The establishment at various centers throughout the city—the Department of Health, settlements, hospitals, museums, etc.—of permanent exhibits showing the various phases of prenatal and infant care. This should consist of photographs, charts, convincing statistics, and literature. Periodical lectures, lantern slides, and moving pictures should be added, as indicated.

"In other words, prenatal care should be popularized."

In any community whether rural or urban, the maternity hospital,

then, or general hospital devoting a certain number of beds to maternity cases should be made the center of community maternity and infant welfare effort. Each maternity hospital in the poorer districts should, where feasible, have an *outdoor service* and should endeavor to have one or more nurses follow up the cases in the home. Every such institution should organize a thorough pediatric and gynecologic clinic.

Where there are no adequate hospital facilities and where there is no social service department, either municipal nurses or nurses of lay organizations will have the entire burden of follow-up work in the home. The truth is, that in the proper working of any comprehensive plan, hospitals, lay organizations, and the municipal or state machinery *must* be brought together.

One point that the writer is particularly desirous of impressing upon his colleagues in the general practice of medicine, is that "maternity facilities are absolutely necessary if the death-rate is to be cut down and invalidism diminished."

All cases presenting any sort of abnormality, are better off in hospitals at the time of delivery (I repeat this again and again). Difficult labor is a really most trying and often dangerous procedure and it is only the specialist who can safely, perhaps, cope with such an ordeal, without the assistance and facilities rendered by the hospital. This same is true for obstetric pathology during pregnancy. The situation varies somewhat in every community but the greatest difference will inevitably appear in the plan for rural and urban communities.

The fundamental differences in carrying out complete maternity protection in cities, are dependent upon (1) whether or not the city contains a medical school with its students to help in the work and (2) upon whether or not there actually is a maternity hospital and whether or not such maternity hospital possesses an outdoor service; *i. e.,* attends cases of labor in the patients' homes.

In rural sections, the question is particularly vital and unsatisfactory because of the great distances and because of the fact that there are still great numbers of counties in this country which have no hospitals of any kind. With such a situation as this, coupled with the unquestioned decrease in the number of rural physicians, it is obviously most difficult to develop a satisfactory method of handling, not only sickness in general, but a proper maternity and infancy program, in particular. It is therefore in *rural communities,* particularly, that the chief burden of teaching and watching over the expectant mother

will fall upon the public health nurse and moreover, it is in these same rural sections that the writer feels that a great need exists for *nurses* who have had special training in *midwifery.*

Such nurses who have had special training in midwifery (and while such training up to the present time has been practically impossible to obtain in this country, it will soon be available) will be of inestimable value, *first,* as *public health supervisors,* and *second,* as *district nurses* working and *only working,* in association with one or more doctors in the community either connected or not, with a community hospital. Certainly in no other way can the burden of the rural practitioner be so diminished and the rural parturient so protected as through the development of "trained maternity nurses."

The ultimate solution of the difficult problem is best assured by the development, with or without state aid, of many hospitals in rural communities. The best plan, seemingly, would be the development of one or more county hospitals, the size and number depending upon the size and population of the county, which could be developed into a *community center both for health and education.* At such a hospital a maternity and infant welfare program could be developed so that the influence would spread into a large section of adjacent territory. As Adair of Minneapolis has so ably expressed it: "The three movements which will tend to help solve this problem in rural sections are, first, the establishment of rural nursing as a part of the public health program; and second, the development of 'group medicine' which is especially adapted to the welfare of the community and which would make it possible for men to do better work along the lines on which they are best qualified to act. The third movement is that which is concerned with the establishment of health and welfare centers throughout rural districts."

The two important developments which render this program a possibility are the wide use of the automobile, and the widespread demand for better roads through most of the states of the Union.

At the time of reviewing this manuscript (February, 1926) the most complete demonstration in "Maternity Protection" yet attempted in a rural community is being carried out in Tioga County, New York State, under the auspices of the New York State Department of Health, the Maternity Center Association of New York and the physicians of the county.

The apparent success of this undertaking is in great measure due to the open-mindedness of the physicians and the tact of the nurses.

DOCTORS' DUTIES AT THE PRENATAL CLINIC

1. One complete physical examination should be made, including head, neck, heart, lungs, breasts and lower extremities; also abdominal examination and pelvic measurements should be taken, together with a pelvic examination. The blood-pressure should be ascertained; a Wassermann test should always be made and a vaginal smear taken on any doubtful case. The management of each case, should be carried out, according to the directions in Chapter II.

2. On each return visit the patient's general appearance should be noted and an abdominal examination made, but no internal examination, unless there is some special indication, until towards the end of pregnancy. The blood-pressure must be taken and a careful urinalysis made.

3. During the last month of pregnancy, at least one if not two careful internal examinations should be made in order to verify the relationship of the fetus to the pelvis. This examination should be carried out with sterile technic. Rectal examinations at the present time are advocated by many. These too must be carried out in a careful manner in order that no infection may be carried to the genitals.

As the time for labor approaches, the vagina should not be invaded excepting by the sterile fingers. Sterile gloves are most advisable, after the vulva has been carefully bathed in an antiseptic solution. The ordinary lubricant from a tube is *not* sterile. It is far better to use either lysol or a sterile solution of green soap or sterile oil.

4. One postpartum examination should be made on every patient in either the third or fourth week, and if possible a second one, at the end of six or eight weeks.

5. A complete examination, too, of the baby should be made at the same time and unless the baby is already under the care of a private physician, it should be referred to the nearest good babies' clinic.

6. All postpartum cases need special watching during the early weeks, in order to try to avoid the development of retroversion or prolapse and in order to insure a satisfactory convalescence from the standpoint of the general health. Misplacements are exceedingly common and occur time after time even though the best care may have been given the patient. One of the surest ways of lessening the development thereof, however, is to have the patient early in the puerperium

assume the knee-chest position twice a day for 10 or 15 minutes. After being up out of bed for a few days, she may substitute for this knee-chest position the exercise called the monkey trot or bear's walk; that is, the position of walking on all fours. This position is a very awkward one but is valuable in many instances and the percentage of misplacements can be greatly reduced thereby. In addition to this, a pessary introduced fairly early will often help to remedy an otherwise bad condition. The pessary should be sterilized before introduction, when it is employed as early as the third or fourth week postpartum. In connection with this postpartum care, the doctor should always warn the patient against early resumption of the marital relation. Such *early* practice not infrequently damages a repaired perineum, prolongs the period of lochial discharge, predisposes to retrodisplacements, and from time to time causes severe pelvic cellulitis or peritonitis.

ADVICE FOR MOTHERS

These directions should be in pamphlet form and may well be supplemented by talks given by a maternity nurse.

Explain to the patient that for nine months the uterus has been growing larger and larger to provide room for the baby as he develops and that it takes about six weeks to return to its normal size and position. During these weeks the mother should do *no heavy work,* because the ligaments, which hold the uterus in position, have been stretched and until the uterus returns to its normal size and weight these ligaments are not strong enough, if overtaxed, to keep it in good position. *Rest* is necessary. It not only helps to conserve the mother's strength but aids in keeping up her milk supply. Unless the mother keeps from getting overtired, little things will irritate her and babies are so sensitive that the mother's irritation makes them fretful. The mother should lie down several times a day, if only for a little while.

All patients should follow, even when apparently well, this general plan in the matter of medical supervision. Until the seventh month, patients should be seen at least once in three weeks. During the seventh and eighth months at least once in two weeks, and during the last month every week or ten days. If it is impractical to see the physician as often as this, it certainly will add much to the patient's peace of mind, as well as to her comfort and safety, to come in contact with a district or public health nurse at stated intervals. At each

visit a specimen of urine should be examined, and, if possible, the blood-pressure taken.

Those who are really sick during pregnancy, or who are likely to have a hard time at delivery, should always strive to secure hospital care. The specialist can often handle the difficult case in the home safely where another of less experience will fail, but there is no question that the hospital is more desirable than the average home in cases where a definite abnormality exists.

Every expectant mother should plan to be as quiet as possible during the week (3 or 4 days) in which she would be unwell were she not pregnant. This precaution is particularly important at the time of the second and third missed periods. At such times miscarriages are more likely to occur. All sexual excitement should be avoided around the "rest days"; absolutely prohibited in women who have a tendency to miscarry. Each mother should understand the reasons for careful supervision during pregnancy and for frequent visits to the doctor or nurse acting under his direction. If she understands that urine examinations and blood-pressure findings are really of value and not merely routine, she will take a real interest herself.

Clothes for a Pregnant Mother.—They should be: *Attractive* for the sake of both the patient and her husband. She should not have to worry about her appearance.

Made to hang from the shoulders with no tight bands, as there should be no downward pressure on the abdomen, such as is caused by tight bands around the waist or an improperly fitting corset. Tight bands around the legs, such as round garters, impede the circulation, sometimes causing varicose veins, and puffiness of feet and ankles.

Made from lightweight material, but warm. A pregnant mother should avoid getting chilled. It is unwise too to be too warmly clothed.

Stockings should be worn. Mothers should not walk around in bare feet, because of getting chilled. Stockings should be held up by suspender garters (Figs. 42, 43) or attached to a maternity corset.

Shoes should be well fitting, sufficiently wide, with as low heels as are comfortable for the individual. Flat-heeled slippers should not be worn about the house and then changed to high heels to go out. When this is done, the pregnant mother often has pain in the calves of her legs, which adds to her discomfort. If high heels are worn usually, she should not change to low ones too quickly, but should be sure to have a solid military heel which will support the foot. High heels make pregnancy noticeable because the effort to maintain a bal-

ance throws the shoulders backward and the abdomen forward; this often causes backache. With high heels she is more likely to turn her ankle or trip and it may be very serious for a pregnant woman to fall.

FIGS. 42, 43.—VIEWS OF GARTERS HUNG FROM SHOULDERS WHEN CORSETS ARE NOT WORN.

The Maternity Corset.—The question usually arises in pregnancy as to whether or not it is advisable for a patient to wear a corset and, in particular, a maternity corset.

The writer feels that on the whole a properly fitting maternity corset is of distinct comfort to the patient during the latter months and that such a corset will tend to give real support in many cases at least to the abdominal muscles. In women with great relaxation of the muscles, the child lies so far forward that it is most uncomfortable

for the patient and, at the same time, mechanically unsatisfactory as she approaches labor or during labor itself.

The essential features of a maternity corset should be these:

(*a*) It should fit well over the hips laterally and posterially

(*b*) There should be no steels used excepting possibly in the back

(*c*) Perhaps the most satisfactory system of lacing is to have laces on either side anterially, and one set posterially

(*d*) The corset should not come too high for if it does it is apt, particularly when sitting down, to press against the breasts

(*e*) There should be a number of darts which can be let out with the increasing size of the abdomen

The accompanying figure presents a very simple type of maternity corset. By the adjustment of the laces and the garters great comfort can be obtained. This model corset is the one recommended by the Maternity Center Association.

FIG. 44.—IDEAL MATERNITY CORSET.
There are three sets of lacings and no bones.

Diet.—The pregnant woman should be given the following advice about the diet:

Eat freely, if you so desire, but do not overeat. Do not eat what you know gives you indigestion.

Do not eat too much at any one meal.

Drink 6 to 8 glasses of water every day.

Drink, if possible, at least 2 glasses of milk every day.

Do not drink any beer, whisky, wine, or other alcohol. These are bad for both kidneys and liver and thus may poison the baby.

Eat meat, meat soup, or eggs sparingly and drink tea or coffee but once a day.

Eat at least one green vegetable every day, more if possible.

Both fresh fruit and stewed are wholesome; grapefruit and strawberries, while most palatable, often disagree, by causing too much acidity, and should then be discontinued.

Smoking during pregnancy is to be condemned.

Sweets, particularly candy, should be eaten sparingly.

Explanation of the Diet.—The expectant mother should understand that the development of the infant's body taxes, in a measure, her own body, as the ingredients of the former's bones, muscles, nervous system, etc., all come from her blood.

How important, then, it is that she, the mother, should only eat wholesome food; should refrain from drinking alcohol, and should allow herself adequate rest.

The baby's body has certain requirements and if deprived of any of these during any period of antenatal or neonatal existence, it is bound to suffer in consequence.

The mother must be in the best possible condition at the end of pregnancy, that she may:

(*a*) Nurse the baby,

(*b*) Adequately care for him, and

(*c*) Still preserve her own health

Classification of Foods.—Explain uses of food in the body, such as: meat, fish, eggs, cheese, nuts, peas and beans (green and dried)—the proteids which furnish some heat and energy and work to build and repair tissue.

Potatoes, whole wheat and rye bread, rice, etc. (starchy foods) furnish heat and energy and store fat.

Butter, cream, oil, etc., aid in fat growth; good butter is easier to digest than any other form of fat, and is a necessary part of the diet.

Leafy and root vegetables are very important as they help to build the bones, muscles, nerves and teeth. (At least one a day should be eaten, more if possible.) Root vegetables supply the necessary salts.

Fruits, such as oranges, lemons, apples, apricots, etc., fresh or dried, contain salts and acids and aid in bone building.

Milk should play an important part in the diet. Milk is a perfect food and moreover contains a considerable amount of lime salts which help to keep the mother strong and make the child sturdy.

Water to the amount of 6 or 8 glasses should be taken daily, for the following reasons:

(*a*) It helps to distribute food supply through the body

(*b*) It aids in elimination of waste

(*c*) It helps to regulate the bowels

(*d*) It furnishes mineral salts, which are necessary for bone building

Constipation.—If constipated, the patient should drink a cup of coffee (no cream or sugar) or two glasses of hot or cold water *before* and hot milk (not boiled) with breakfast. She should go to the toilet at the same time every day (after breakfast is best). During the day she should eat coarse bread, green vegetables, stewed fruit; drink no tea, but all the water possible: at least 6 glasses, hot or cold; eat 4 to 6 prunes a day as required. The following recipes are very good: Cook one pound of prunes; about 5 minutes before the prunes are cooked, add one cup of senna tea made from 2 tablespoons of senna leaves. (Slice of lemon cooked with prunes adds to their flavor.) Another method: Take one pound of dried figs, one pound of prunes, after the stones have been removed; chop fine in a meat chopper and add two ounces of senna leaves and one to two tablespoons of molasses. Mix thoroughly and keep in a covered jar. Eat one to two tablespoons at night. If not relieved, consult the physician again.

Teeth.—A visit to the dentist for prophylactic treatment is important. No extractions should be done during pregnancy without consulting a doctor, but fillings and cleaning may and should be done if necessary. A faulty dietary and neglect in the care of the teeth are responsible for the tradition that each child costs the mother a tooth. Special care during pregnancy is always necessary as the mouth frequently has an acid reaction. This may be helped by using an alkaline mouth wash. Milk of magnesia or limewater are very good. Always visit your dentist again after convalescence is complete.

Kidneys.—The kidneys are important organs because much of the mother's waste is thrown off by them, and so they need special attention. The best way to know that they are functioning properly is to measure the urine passed in 24 hours, at least once a month. It should amount to 1½ quarts a day, and should be examined at regular and frequent intervals by the doctor or nurse.

Skin.—The special function of the skin is to equalize the body temperature. It also helps in the elimination of waste. The physician should describe the pores of the skin and the necessity of keeping them open by daily bathing, so that the poisons or waste may be more easily disposed of. No tub bath should be taken after the eighth month with-

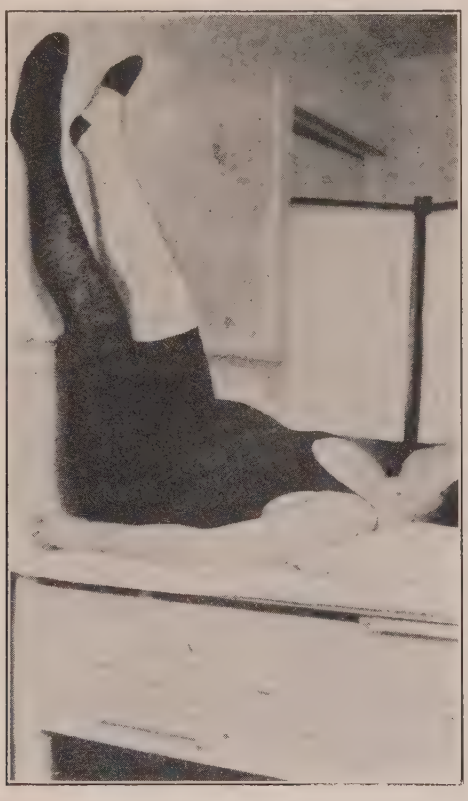


FIG. 45.—TREATMENT FOR VARICOSE VEINS OF LEG.
Bandage together with elevation of leg against wall.

out the doctor's consent; but a complete sponge bath should be taken every day. Avoid chilling and never have the water too hot or too cold.

Rest.—Pregnant mothers should have at least eight hours' rest at night. During the day rest for one hour; or if it is impossible to lie down for one whole hour, she should lie down if only for five or ten minutes, several times a day.

This rest should be taken not only to conserve the strength of the mother but to prevent overfatigue. It lessens the strain on the cir-

culatory system, and relieves the pressure and increased strain on the muscles.

While working the pregnant woman should sit down as much as possible.

Exercise.—Moderate exercise should be taken, but never to the point of fatigue. Hurrying and undue strains must be avoided. Housework in a well ventilated room is beneficial, if it is not too heavy. Motoring on rough roads and horseback riding are harmful.

Fig. 46.—Treatment (Postural) for Varicosities of the Vulva.

Varicose Veins.—If varicose veins are present and troublesome notify the doctor or nurse. One or the other will teach you the right-angle position (Fig. 45), or the so-called elevated Sims' position—the latter is particularly good for varicosities of the veins.

Danger Signals of Pregnancy.—Report to your physician at once:

Any persistent nausea or vomiting continuing after the third month, and such symptoms, *if severe,* before the third month

Persistent or severe headaches

Dizziness

Swelling of the hands and feet

Blurring of the sight or spots before the eyes

Puffiness under the eyes or elsewhere about the face

Persistent headache or neuralgic pains, especially about the pit of the stomach

Lessening or stopping of fetal movements after they have begun

Bleeding or a blood discharge

Pain in the lower back followed by cramp-like pains in the abdomen

Mental depression, anxiety or apprehension

If you begin to flow in any degree, go to bed at once and send for your physician.

Approach of Labor.—The pregnant woman should be given the following information and instructions:

Labor begins with pains in the back or abdomen; with bleeding or watery discharge. If you have any labor pains or bleeding before the time you expect your baby, go to bed and send word to your hospital, doctor, nurse, or midwife, at once.

If you are going to the hospital, have ready after the eighth month a set of baby clothes, to take with you to put on the baby when you bring it home. Do not take anything else for the baby with you unless you are asked to. As soon as labor begins, go to the hospital.

While waiting (if you are not going to the hospital) boil a large quantity of water in two covered vessels and set one aside to cool. Prepare your bed as the nurse has shown you, take a warm sponge bath, braid your hair in two braids, get out a set of baby clothes ready for the nurse to dress the baby, a hot water bottle or a substitute to keep the baby warm. Get out the supplies needed for yourself. Have a good sized, strong table ready to be used for delivery. When this is covered with blankets, a rubber sheet and a plain sheet, it will not be uncomfortable and will add much to the safety of the delivery and to the comfort of the doctor.

At this time it is important to secure either one ounce of a one per cent solution of silver nitrate or a 20 per cent solution of argyrol. These solutions are used immediately at the birth of the child for the eyes. It is usually wise to take one hot soapsuds enema, and, if there is time, a thorough sponge bath. Labor is rarely easy, and yet, on the other hand, it should not be approached with fear. *Fear* acts peculiarly on the progress of labor. It adds to the feeling of pain and, at the same time, it is likely to delay the progress by causing the contractions of the womb (which cause the pain) to be less effectual. Firmness, yet patience and gentleness on the part of the doctor, nurse, or midwife add much to the spirit of self-control. Laughing gas and ether carefully used by the physician toward the end of labor

have almost magical effect in easing the last suffering. Anesthetics do harm, in the writer's opinion, when given too early in large amounts, because of fear or lack of self-control. Labor is prolonged thereby and rendered more difficult; the baby is more likely to be asphyxiated. Midwives are not, as a general rule, permitted to administer anesthetics of any kind. Chloroform in this country is used in labor far less than formerly.

Supplies for the Mother for Labor.—A. A relatively expensive list includes the following:

Bed pads: 3 or 4, 36 inches square to cover half the bed, of quilted material or made with newspapers. To make newspaper pads, take six to twelve thicknesses of newspaper, open to full length, and cover with freshly laundered old muslin, clean gauze or cheesecloth, tacked in place. As a precaution, where possible, the entire mattress should be covered with oilcloth, put on under the bottom sheet.

Vulva pads: four dozen pads. These should be kept sterile. (These may be bought or made up.)

Absorbent cotton, 2 pounds in ½ pound packages, sterile

Sterilized gauze, 5 yards, sterile

Towels, 1 dozen, old, soft towels, sterile

Nightgowns, sufficient number for daily change

Plenty of sheets and pillow cases

Abdominal binders, 2, 2 yards long, 18 inches wide, unbleached muslin.

Hand basins, 2, agate or enameled

Pitcher, 1 agate or enameled, 2- to 4-quart

Safety pins, 2 dozen, assorted sizes

Boric acid powder, 4 ounces

Vaselin, white, one tube; or sterilized olive oil

1 bed pan

1 pair white cotton stockings for labor

Lysol, 3-6 ounces

Iodin, 2 ounces

Sterile cord dressing with cord tape

Tincture of green soap, 4 ounces.

B. For those who are obliged to be content with little and yet who desire a delivery as clean and safe as possible in the home, a sterile obstetric package can now be purchased at small cost from certain Health Departments, such as those of Minneapolis (which originated the idea), New York State, etc. Sample sterile packages contain:

1 bed protector
1 delivery pad
6 sanitary pads, large size
12 sanitary pads, medium size
12 gauze sponges
1 cord dressing with tape
1 cord dressing without tape
2 bobbin tapes, each length 9 inches
6 cotton sponges
1 baby band
4 towels
2 sanitary belts
1 pair leggings

Baby's Clothes and Supplies.—The following list of baby clothes and toilet necessities may be modified as to material, quantity, and quality to suit the individual taste and pocketbook:

24 diapers, 18″ x 18″ (this is a small number) [2]
4 bands, 6″ x 27″ (flannel)
4 shirts, size 2, cotton and wool or silk and wool
4 bands, size 2, cotton and wool or silk and wool
3 petticoats
3 slips
4 quilted pads, 11″ x 16″
1 oilcloth or rubber dam, 11″ x 16″
12 medium safety pins
12 small safety pins
4 towels
2 wash cloths, old pieces of linen
1 package of castile soap
1 package of absorbent cotton
½ pint oil, sweet or albolene
1 package tooth picks
soap for pincushion
bottle for boiled water
2 nursing bottles with wide neck (3 to 6 ounce size)

Baby's Toilet Tray.—A tray should be used to keep together in one place things needed for baby's toilet. (The tray may be of wood, enamel ware, glass or *papier-mâché*. It should be easy to keep clean

[2] In more expensive outfits 5 dozen diapers are usually provided.

and light enough to carry in one hand. Jars and dishes must have covers). The tray should hold the following articles:

Glass jar for boiled water used in cleansing mother's nipples before and after nursing the baby

Glass jar for large swabs used in cleansing the mother's nipples. These prevent dipping the fingers into the boiled water

Glass jar for small swabs used in cleansing the baby's ears, nose, and genitals

Glass jar for nipples. The jar should be boiled each day; nipples should be boiled after each using and put in this dry jar. Hygeia or anticolic nipples are advised

Glass dish for soap (flat). Castile is best

Glass dish for oil (flat). A day's supply is used at bath time for cleansing baby's nose, ears, and genitals, and during day for cleansing baby's buttocks when diapers are changed. Mineral oil is best because it does not deteriorate

Cake of soap for pincushion. It is economical and easy to keep clean; points of pins are always lubricated

Bottle for boiled water. Six ounces should be boiled fresh each day and kept corked

Nursing bottle. Hygeia or other for giving baby water

Cornucopia for waste

Covered Pail for Soiled Diapers.—Explain care of soiled diapers. Shake or brush soiled diapers clean, then put to soak in covered pail of borax solution (one tablespoon of borax to 2 quarts of water). Fresh solution should be made daily. When diapers are just wet, drop them into pail of borax solution. Each morning wring diapers out of borax solution, wash, using some form of mild white soap. Rinse through two waters and dry in sun if possible. Bluing or strong yellow soap should never be used, as these may irritate the baby's skin.

Care of Flannels.—Always wash baby's shirts and bands in tepid water and ivory or mild white soap. Rinse thoroughly and dry slowly in the shade. Cold water, drying too quickly or drying in the sun shrinks flannels. Wooden forms for drying baby's shirts may be bought and are very helpful in keeping garments in shape.

Baby's Bed.—This bed may be a basket, crib, box, or carriage. The physician should explain that it is healthier for the baby to sleep alone, giving reasons. For instance, he thus gets better air, the

mother gets better rest. The bed is easy to keep clean, as a pillow slip is easier to wash than a full sized sheet.

Hair or Felt Mattress.—This mattress should be firm and flat, never made of feathers, as the little body should be supported and kept straight. A rubber case should cover the mattress completely. This should be taken off and the mattress allowed to air each day. A cotton pillow slip is put on over the rubber case (an economy).

FIG. 47.—TEACHING EXHIBIT AS USED BY MATERNITY CENTER ASSOCIATION.

Blankets.—Crib size, of light weight wool or wool and cotton, and washable. Mosquito netting is needed to throw over baby's bed during the fly season. An elastic fitting the bed will hold it in place.

Pillow.—On the whole it is safer to use no pillow. If, however, one is used, this should be small, flat, and fairly hard. Babies of all ages have smothered in very soft ones.

THE CARE THE BABY NEEDS

During the first nine months of extra-uterine life the baby not only gains in weight and grows, but he has to learn more new things than at any subsequent nine months of his life.

Regular habits should be emphasized.

Breast feeding should be carried out according to doctor's schedule.

Bathing.—Bath time should be the same every day.

Rest.—Baby is supposed to sleep about 20 hours a day at first. He should not be picked up every time he cries. The baby who does not get sufficient rest is nervous and fretful.

Fresh Air.—Every baby needs all the fresh air and sunshine it is possible for him to have.

Regular Habits of Bowels.—The baby should be placed on a chamber at the same hour each day.

There is need for continuous medical supervision either from the doctor or from some welfare agency, such as the infant clinic, later the preschool clinic and visiting nurse service.

A birth certificate should always be secured and preserved. It is necessary:

To prove his right to go to school,
To prove his right to working papers,
To prove his right to an inheritance,
To prove his right to vote,
To prove his right to marry,
To prove his right to a passport when traveling abroad,
To secure protection in foreign countries,
To prove his mother's right to a widow's pension.

In as much as this movement for "complete maternity care" is still in its infancy in great sections of our country, education must be the keynote of approach to each new community. This education should be undertaken by the physician, individually or in groups and it is well to recognize the fact that the safest, surest approach is the personal one through the public health nurse or social worker. Much, too, can be accomplished by carefully chosen printed advice, and suggestions put out by county medical societies, State Departments of Health, etc. For those who may want to begin in their community a campaign for better maternity care and who are able to obtain the services of one or more public health nurses, the writer feels that the general suggestions here given for the carrying on of this work will be of some help. These may be amplified for groups of mothers and demonstrations will always attract marked attention.

Many of the details will seem unnecessary and yet I am sure that the general plan will prove of great help to the mothers you wish to

educate and whose health and offspring you desire to protect. If we criticise the nurse for encroaching on the province of the physician, is it not all too often due to indifference or ignorance regarding public health movements on the part of the latter? If the physician does not concern himself about the welfare of the community in which he lives and the comfort and safety of "motherhood" he must not be surprised at the interest of his State Health Department or that of some lay nursing organization.

BIBLIOGRAPHY

MENDENHALL, A. N. Indianapolis, cit. by Mosher.
MOSHER, G. C. Am. J. Obst., 1924, 294.
SOBEL, J. New York City Department of Health, Monograph, 1919.
Maternity Center of New York, Report.

INDEX

Abdomen, binders of, delivery and, 32, 131
— distention of, abruptio placentæ and, 55
— examination of, 160
— fetal death in utero and, 50
— pain in, danger signal, 169
Abnormalities, fetal causes of, 67
— — percentage of, 49
— infant, care of, 137, 138, 149
— pelvic, pregnancy and, 15, 18
Abnormal obstetrical cases, care of, 154
— hospital service for, 158, 162
Abortion, after-care, 28
— artificial, 6, 18, 29, 42
— cardiac cases and, 33
— criminal, 6, 45
— fibromyomata and, 42
— gonorrhea and, 61
— myomata and, uterine, 42
— ovariotomy and, 41
— patient's history of, 17
— prenatal care and, 2, 7, 12, 44-48
— retrodisplacements and, 20
— septic uterus following, treatment of, 90
— syphilis and, 78
— tubal infections and, 6
— tuberculosis and, 29
— tumors of uterus and, 42
Abruptio placentæ, hemorrhage and, 51
—placenta prævia differentiated from, 55
— prenatal care and, 52-56
— toxemia of pregnancy causing, 22
— treatment of, 56
— tumors of uterus and, 42
Abscesses, alveolar, pyelitis caused by, 36
— perinephritic, 35
— puerperal ulcer causing, 88
Abscesses, visceral, thrombophlebitis causing, 94
— vulvovaginal, gonorrhea and, 62
Acapnia, labor and, 130
Accidents, labor, fetal and infant deaths due to, 7, 9
— — maternal deaths due to, 4
— — shock following, 130-135
Accouchement forcé, 38
Accoucheurs, elimination of, 157
Acetonuria, acidosis at labor and, 131
— fetal death in utero and, 50
Acidity, pregnancy and, 165
— urinary, 21
Acidosis, 130-133
— treatment of, 131
Adalin, tachycardia and, 33
Adrenal hemorrhage, neonatal syphilis confused with, 63
Adrenalin chlorid, nausea of pregnancy treated with, 26
Air, fresh, for infants, 174
Albuminuria, 21
— maceration and, 49
— maternal death-rate due to, 4
— pyelitis cases and, 35
— toxemias and, 37, 38
Alcohol, fetal abnormalities caused by, 67
— heart disease contraindicating, 32
— puerperal infections contraindicating, 99
— use of, pregnancy and, 1, 24, 165
Alveolar abscess, pyelitis of pregnancy and, 36
Amniotic cavity, infection of, 96
Anaphylaxis, milk injections followed by, puerperal sepsis with, 103
Anemia, abortion causing, 6
— newborn, 112
Anencephalus, hereditary syphilis causing, 67

Anesthesia, convulsions in, 38
— deaths from, acapnia and acidosis and, 130, 131
— infection caused by, 91
— labor and, 109, 169
— rectal, cardiac cases and, 33
— tuberculosis and, 29
Ankles, puffiness of, pregnancy and, 162
Antenatal death, abruptio placentæ and, 55, 56
— cardiac cases and, 33
— causes of, 9, 48, 117
— — convulsions, 39
— — cranial pressure, 117
— — falx and tentorium rupture, 117
— — labor complications, 111
— — maternal conditions, 9
— — syphilis, 63, 64
— induction of premature labor and, 107, 108
— in utero, 48-50
— midwives' responsibility for, 153
— placental separation and, 55
— prevention, prenatal care and, 8, 9, 10
— rates, 3, 4
— — syphilitic mothers treated during pregnancy and, 81, 82
Antenatal syphilis, fetal deaths due to, 63
Antepartum hemorrhage, shock and, 130
Anus, infections from, labor and, 96
— rhagades at, syphilitic infants and, 75
Anxiety, pregnancy and, 39, 169
— breast feeding and, 140
— hemorrhage and, 50
Aortic disease, pregnancy and, 30, 31
Apprehension, pregnancy and, 169
Argyrol, eyes treated with, 137, 169
— gonorrhea treated with, pregnancy and, 62
Arhythmia, pregnancy and, 31, 33
Arm, fractures of, birth, 123
— palsy of, birth, treatment of, 124, 125
— paralysis of, newborn, treatment of, 127
Arsenic medication, syphilis during pregnancy treated with, 80, 81
Arsphenamin injections, syphilis treated with, pregnancy and, 80, 81, 82
— syphilitic infants and, 83
Asepsis, labor and, 86, 95, 109
— miscarriages and, 47, 109
Asphyxia neonatorum, 137, 170
— cerebral brain rupture and, 114
Aspirin, mastitis and, 147
Atrophy, acute yellow, fetal death and, 48
Auricle, fibrillation of, pregnancy and, 31
Auto-infection, puerperal sepsis and, 87, 91
— vaginal, 87
Autopsies, infant, 9
— puerperal infections originating at, 86

Backache, pregnancy and, 46
Bacteremia, gangrene and, 94
— protein injections in, 103
— staphylococcus causing, blood transfusion in, 104
— streptococcus causing, 93
— — serum treatment in, 103
Bacteria, urine in pregnancy and, 21
— — pyelitis cases and, 35, 36
Bacteriology, puerperal infections and, 87
Bags, rubber, induction of labor with, 108, 109
Barley water, infant feeding and, 145
Bathing, baby's, 173, 174
— pregnancy and, 167
Bear walk exercise, illus., 20
— retrodisplacement and, 19
— uterine misplacements corrected by, 161
Beck abdominal binder, primary shock and, 131
Bed, baby's, 172, 173
— pads for, labor and, 170
Beef, contraindicated in diet of pregnancy, 23, 24
Bellevue Hospital, N. Y., prenatal care in, 10

Benzoin, nipples treated with, 143
Berwind Maternity Clinic, N. Y., prenatal care in, 10
Binder, abdominal, cesarean section and, 32
— — primary shock and, 131
Birth, abruptio placentæ and, 56
— accidents at, 4, 7, 8, 9, 130-135
— acidosis at, 91, 130-133
— anesthesia during, 109, 169
— — convulsions in, 38
— — deaths with, acapnia and acidosis causing, 130, 131
— — infection caused by, 91
— — rectal, cardiac cases and, 33
— — tuberculosis and, 29
— aseptic preparations at, 86, 95, 109
— blood-pressure during, shock and, 131
— bougie method at, 110
— breech delivery, 8, 56, 60, 111, 117, 118, 121, 123, 131, 136
— — technic of, 128
— certificates of, need for, 174
— convulsions at, 4, 10, 36, 48, 116
— — treatment of, 38, 39
— dangers of, 150
— decompensation in, treatment of, 32, 33
— dystocia in, 19, 41
— exhaustion at, breast milk and, 141
— forceps delivery, birth palsy in, 125
— — cardiac cases and, 32, 33
— — clavicular fracture in, 121
— — conservatism in, 19
— — convulsions after, 116
— — falx and tentorium ruptured in, 117
— — feeble-mindedness and, 111, 112
— — hematoma and, 125
— — hemorrhages in, bulbar and medullary, 120, 122
— — lacerations and, 89
— — placenta prævia and, 60
— — skull injuries in, 116
— hemorrhage during, 91, 150
— — brain, newborn, 139
— — central nervous system, death at birth and, 118, 119, 120
— — cerebral, newborn, 111, 112, 113, 137, 150
Birth, hemorrhage during, cerebrospinal, breech deliveries and, 117
— — dural, birth injuries and, 113
— — induction and, premature labor, 107
— — intracranial at birth, 111, 120
— history of patient and, 17
— hospital delivery, 5, 90, 157, 158, 162
— — sepsis in, 5, 90
— inertia and, 91
— infections during, 9, 86-105
— — abortion and, 6, 43, 47
— — bacteriology of, 87
— — blood transfusion and, 103, 104
— — Census reports of, 2
— — charts, illus., 100, 102
— — chemical treatment of, 104
— — eclampsia and, 92
— — endometritis and, 93
— — frequency of, 90
— — gonococcus causing, 61, 94
— — hygienic prevention of, 95, 96
— — leukocyte count in, 101
— — maternal deaths due to, 86
— — metritis and, 93
— — midwives' responsibility in, 153
— — miscarriage and, 47
— — mortality rates of, 90
— — operative treatment of, 91, 104
— — pathology of, 88
— — placental, 91, 94
— — predisposing causes of, 91
— — prenatal care and, 5, 12
— — protein therapy and, 103
— — serums in, 99-103
— — specific treatment of, 97
— — Staphylococcus aureus causing, 87
— — streptococcus causing, 87
— — symptomatology of, 93
— — thrombophlebitis and, 94
— — thrombosis and, 89
— — treatment of, 95-104
— injuries at, 111, 112
— — cephalic, 8, 112
— — clavicular, 121, 123, 127
— — extremities and, 121
— — infant death due to, 7, 8
— — intrapartum, 111-129
— — nerves and, 124

Birth, injuries at, obstetrical management and, 8
— — spinal, 117
— instructions, 95, 169
— lacerations at, 45, 88, 91
— — repair of, 89, 97
— mania at, acute, 40
— midwife's service at, 151-154
— operative delivery, 91, 104
— — death from sepsis in, 90, 91
— — dystocia and, 19
— — inertia necessitating, 91
— — infections following, 87, 90, 91, 104
— — injuries in, 111, 128
— — pelvic examination and, 19
— — shock prevention and, 19
— pains at, 109, 169
— — abruptio placentæ and, 54, 55
— — acute cystoma and, 42
— — breast feeding and, 140
— — fibromyomata and, 44
— — heart, 30, 31
— — lower back, 169
— — neuralgic, toxemias and, 37
— — premature imitation of, 109
— — prenatal care and, 45
— palsy caused by, 124, 125
— pelvic measurements at, 18
— placenta prævia and, 60
— premature, cardiac cases and, 33
— — Census reports of, 2
— — conservatism and, 19
— — death in utero prevented by, 49
— — early infant death caused by, 6, 7
— — fetal death due to, 9
— — hemorrhage and, newborn, 138
— — hereditary, calcium in, 23
— — induction of, 106-110
— — prenatal care preventing, 7, 12, 15, 44, 149, 150
— — syphilis causing, 79
— — toxemias of pregnancy causing, 7
— — uterine myomata and, 42
— prenatal care and, 12, 15, 149
— public health measures, protection of mother and child and, 150-175
— rubber bags and, 108
— sepsis causing deaths at, 4
— shock following accidents of, 130-135
Birth, shock following accidents of, primary, 131
— — secondary, 133
— shoulder delivery, 121, 122, 123, 128
— — fractures in, 127
— — subluxation in, birth palsy due to, 124
— — technic of, 128
— statistics of, U. S., inadequacy of, prenatal care and, 2
— stillbirths at, autopsy of, 9
— — breech deliveries and, 117
— — causes of, 8
— — Census reports of, 8
— — cerebral hemorrhage and, 112
— — frequency of conception and, 6
— — history of patient and, 17
— — reduction of, prenatal care and, 10, 12, 81, 82, 84
— — spinal injuries and, 121
— — syphilis and, 63, 64, 77, 79. 84
— — tears and, falx and tentorium, 117
— — traumatism and, 111
— supplies for, 170
— tamponage in, 110
— toxemia and, 131
— tuberculosis and, 29
— tumors at, 18, 41-44, 45
— uterine myomata and, 42
— version delivery, 120, 121, 131
— — abortion and, 43
— — Braxton-Hicks, placenta prævia and, 60
— — cardiac cases and, 33
— — collapse in, 131
— — conservatism and, 19
— — decompensation and, 32
— — internal podalic, placenta prævia and, 60
— — spinal injuries and, 120, 121
— vertex delivery, 117, 121
— Wassermann reaction at, 76
Bismuth, nausea of pregnancy and, 25
— nipples treated with, 143
— tamponage of uterus with, 56
— — abortion and, 29, 48
— — placenta prævia and, 59
Bladder, urinary, pregnancy and, 34
— — pyelitis and, 34, 35, 36
Bleeding, 50-61

Bleeding, abortion and, 47
— abruptio placentæ and, 52-56
— danger signal, 45, 169
— hysterectomy and, 42
— placenta prævia and, 58
— prenatal care and, 12, 45, 150
— puerperal infections and, 91
— uterine myomata and, 42
Blindness, infant, prenatal care preventing, 16
Blood, chemistry of, pregnancy and, 22
— clotting of, neonatal, 113, 120, 138
— fetal, calcium and, 139
— injections of, neonatal, citrate method of, hemophilia and, 139
— — intracranial pressure and, 115
— — intramuscular, facial paralysis and, 128
— retroplacental, Wassermann reaction of, 76
— staining of, 15, 47, 50, 58, 169
— transfusion of, abruptio placentæ and, 56
— — puerperal sepsis and, 103
— — shock following labor and, 134, 135
Blood-pressure, 18, 22, 160
— chronic high, fetal deaths and, 48
— decompensation and, pregnancy and, 32
— delivery and, 6, 131
— nitrogen partition examination and, 22
— shock following labor and, 131
— tests for, pregnancy and, 162
— toxemias of pregnancy and, 37
Blue ointment, syphilitic infants treated with, 83
Blueness, neonatal, 137, 138
Bones, cranial injuries to, 113
— edema simulating syphilis in, 63
— fractures of, 128
— osteochondritis of, 70-73
— syphilitic lesions of, 63, 70-73, 76
Boracic acid, nipples treated with, 143
— urine analysis and, 21
Borax, diapers with, care of, 172
Bottle feeding, 140, 141
Bougie, labor induction with, 110
Bowels, infants', regulation of habit in, 174
Brain, birth injuries of, 111, 137
— edema of, 137
— fetal, calcium and, 139
— hemorrhage of, 111, 118, 139
Brain-pressure at birth, 112
Braxton-Hicks version, placenta prævia and, 60
Bread, diet of pregnancy and, 23
Breast feeding, 139-148, 173
— colic and, 145
— early neonatal, 136
— milk in, 139-148
— — examinations of, 144
— — quality and quantity of, 142-145
— — supply of, maternity institutions', 157
— schedule of, 174
— stools and, green, infants', 145
— syphilitic infants and, 65
— tuberculosis mothers and, 26, 29
Breast-pump, electric, illus., 144
— use of, 141, 142, 143
— — mastitis and, 147, 148
Breasts, changes with fetal death in utero and, 50
— hygiene of, 141
— prenatal care of, 157
— streptococcic infection and, 93
Breathlessness, pregnancy and, 30
Breech delivery, abruptio placentæ and, 56
— arm fractures in, 123
— clavicular fracture in, 121
— injuries at, 8, 111, 117, 123
— mortality rate of, 121
— placenta prævia and, 60
— pre-eclamptic patients and, collapse in, 131
— Smellie-Veit method, 118
— spinal cord injuries, 118
— stillbirths and, 117
— technic of, 128
— warmth essential to, 136
Bronchial pneumonia, thrombophlebitis causing, 94
Bulbar hemorrhages, neonatal, 120
Butter, diet of pregnancy and, 165
Buttermilk, infant feeding and, 145

Caffein, acute decompensation and, pregnancy and, 32
Calcification, cartilage, syphilitic infants and, 70-73
Calcium caseinate mixtures, infant feeding and, 145
Calcium medication, pregnancy and, 23, 139
Callus formation, birth palsy and, 124
—fractures and, birth, 121, 127
Candy, diet of pregnancy and, 24, 165
Caprokol, pyelitis treated with, 36
Caput succedaneum, 112
Carbon dioxid, loss of, labor and, 130
Cardiac diseases, pregnancy with, anesthesia and, 33
— — hereditary syphilis and, 67
— — induction and, premature labor, 33, 107
— — Karrel diet in, 37
Care, prenatal, 1-14
— abortions and, 7, 44-48
— diet of pregnancy and, 22-25
— essentials of, 15-62
— examination of patient and, 17-22
— exhibits and, public health, 157
— medical complications of pregnancy and, 25-62
— organized, 12-14
— prematurity and, 7
— public health and, 149-175
— — directions for mothers in, 161
— — infant care and, 173
— — midwife and, 151, 154
— — New York City plan for, 155
— purposes of, 15
— sepsis and, 5
— syphilitic infant deaths reduced by, 64, 82
Cartilage calcification, newborn, syphilis and, 70-73
Casts, urinary, pregnancy and, 21
— toxemias and, 37, 38
Catheterization, kidney pelvis, pyelitis of pregnancy and, 36
Cellulitis, pelvic, postpartum care and, 161
— puerperal infections and, 89, 93
— puerperal ulcer causing, 88
Central nervous system, newborn, hemorrhage in, 118-120
Cephalematoma, newborn, 112
Cephalic injuries, birth, 8, 112
Cereals, diet of pregnancy and, 22
Cerebral embolism, labor and, 11, 33
Cerebral hemorrhage, breech delivery and, 114
— labor and, 150
— — stillbirths and, 112
— newborn, 113, 137
— — deaths due to, 111
— operative delivery and, 114
— prematurity and, 114
— spontaneous delivery and, 114
Cerebrospinal hemorrhage, breech deliveries and, 117
Cerium oxalate, nausea of pregnancy treated with, 25
Cervical amputation, abortion and, 45
Cervical nerves, newborn, rupture of, birth palsy from, 124, 125
Cervical vertebræ, newborn, fractures of, breech delivery and, 8
Cervix uteri, abortion and, 29, 45, 48
— abruptio placentæ and, 55
— argyrol treatment of, gonorrhea and, 61
— asepsis of, labor and, 109
— cardiac cases and, 33
— dilatation of, 55, 60, 89, 91, 96, 109
— — rubber bags used in, 32
— fetal death in utero and, 50
— lacerations of, 45, 89, 91
— — repair, 97
— multipara cases and, 108
— placenta prævia and, 59, 60
— puerperal infections and, 89, 91, 96
— tamponage of, 48, 59, 110
Cesarean section, 128
— abortion and, 43
— abruptio placentæ and, 56
— cardiac disease and, 32, 33
— conservatism in, 19
— death in utero prevented by, 49, 107
— eclampsia and, death-rate in, 92
— indications for, 107
— ovarian tumor and, 41
— placenta prævia and, 60
— toxemias of pregnancy and, 38
— tuberculous women and, 29
Champetier de Ribes colpeurynter, 108
Cheese, diet of pregnancy and, 23

Chicken, diet of pregnancy and, 23
Child conservation, abortion and, 6
— prenatal care and, 12, 15
— public health measures for, 150-175
Chilling, avoidance of, pregnancy and, 162
— skin, newborn, 138
Chills, thrombophlebitis, 93
Chloral hydrate, convulsions of pregnancy treated with, 38
Chlorid of lime, asepsis of labor with, 86
Chloroform, pregnancy and labor and, 170
— convulsions contraindicating, 38
— urine analysis and, 21
Chocolate, contraindicated in pregnancy, 24
Circulation, newborn, 136
— pregnancy and, 30, 162
Civic maternity protection campaigns, 155
Clavicle, fracture of, birth, 121, 127
— — treatment of, 123
Cleft-palate, hereditary syphilis and, 67
Clinics, gynecologic, public health and, 158
— obstetrical, need for, 150
— pediatric, public health and, 158
— prenatal, 10-13
— — doctors' duties at, 160
— — maternity protection and, 156
— — midwifery and, 154
— — stillbirth observations in, 8
— — Wassermann reaction reports in, 77
Clothes, baby, 171
— maternity, 162-164
Clotting, blood, newborn, 120, 138
— — head injuries and, 113
Cocoa, diet of pregnancy and, 23
Cod-liver oil, infant feeding and, 146
Coffee, diet of pregnancy and, 23, 165
— heart disease contraindicating, 32
Cohabitation, pregnancy and, 20, 45, 95
Colic, infant, breast feeding and, 145
Collapse, delivery and, 131
Colles' law, 66
Colon, bacillus infections of, bacteremia and, 94
— — pyelitis of pregnancy and, 34, 35, 36
— — puerperal, 88, 89
— irrigations of, eclampsia and, 39
— — nausea and, 25
— — pyelitis and, 34
— — toxemias and, 37
Colored women, pregnant, syphilis among, 77
Coma, acidosis cases after labor and, 131
Community maternity protection, 155
— hospitals and, 159
— midwifery and, 154
— prenatal care and, 11
Conception, frequency of, health and, 6
Conceptional syphilis, 65, 66
Condylomata, gonorrheal, ferric chlorid in, 61
Confinement shelters, civic, 157
Congenital diseases, infant death and, 8
Congenital syphilis, bone lesions in, 63, 70-73, 76
— ear conditions due to, 76
— eye conditions due to, 76
— infant deaths due to, 64, 65, 77
— prenatal care and, 14
— teeth conditions due to, 76
— test for, living child, 78
— treatment of, 81, 83
Congestion, cerebral, newborn, 137
— pelvic, abortion causing, 6
Conservation, child life, 6, 12, 15, 150-175
Constipation, pregnancy and, 22, 25
— — treatment of, 166
Contagion, puerperal fever and, 86
Convalescence, post-natal, 160
Convulsions, newborn, blood injections in, 116
— pregnancy and labor, acidosis and, 130
— — Dublin treatment of, 39
— — puerperal sepsis following, 92
— — shock and, 130
— — Stroganoff treatment of, 38
— toxemias and, 36, 38

Convulsions, toxemias and, fetal deaths in, 48
—— maternal deaths in, 4
—— prenatal care in, 10
Cord, spinal, injuries of, birth, 117, 118, 137, 150
—— breech delivery and, 8
—— hemorrhages of, 117, 120
—— illus., 122
—— vertex delivery and, 117
— umbilical, abnormalities of, fetal death and, 48
—— bleeding, newborn, 138
—— clamping, 136
—— pyogenic infections of, fetal death and, 48
— Wassermann reaction of, mothers with, prenatal treatment of, 82
—— newborn with, 78
Corrective exercises, bear's walk, misplacements and, 19, 20, 161
— knee-chest position, 19, 35, 161
— monkey trot, 20, 161
— varicosities of vulva and, 168
Corrigan pulse, pregnancy and, 31
Corset, maternity, 162, 163
— illus., 164
Crabs, contraindicated in diet of pregnancy, 24
Cramps, abdominal, pregnancy and, 169
Cranial bones, fetal, calcium and, 139
—— death due to over-riding of, 50
Cranial pressure, deaths due to, 117
Credé expression of placenta, puerperal sepsis and, 91, 94, 97
Crying, newborn, 137
— hunger, 145
Curettage, dangers of, abortion and, 47
— uterine, puerperal sepsis and, 104
Cushing osteoplastic flap, head injuries and, birth, 113
Cyanosis, heart failure and, 30
— newborn, 138
Cystomata, pregnancy, 44
—— dermoid of the ovary, 41
—— illus., 43
—— operations on, 42, 44
—— vulvovaginal, 62
Danger signals, pregnancy, 168
Day nurseries, prenatal care and, 156
Deafness, congenital syphilis and, 76
Death, antenatal, prenatal care and, 8, 9
—— syphilis and, 63
— fetal, abruptio placentæ and, 55, 56
—— cardiac cases and, 33
—— causes of, 9, 48, 117
—— convulsions causing, 39
—— cranial pressure causing, 117
—— falx and tentorium rupture causing, 117
—— induction and, premature labor, 107, 108
—— in utero, 48-50
—— labor complications causing, 111
—— maternal conditions causing, 9
—— midwives' responsibility for, 153
—— placental separation and, 55
—— prevention, prenatal care and, 9, 10
—— rates, 3, 4, 81, 82
—— syphilis causing, 63, 64
— infant, age rates, 7, 8
—— breast feeding and, 140
—— causes of, 7, 14, 149
—— early, causes of, 6, 7
—— enlarged thymus and, 138
—— factory day nurseries and, 156
—— falx and tentorium rupture causing, 117
—— hemorrhages causing, central nervous system, 118, 119, 120
—— prenatal care and, clinical reports of, 10-13
—— seasonal, 4
—— sepsis causing, 98
—— spinal injuries causing, 121
—— syphilis causing, 7, 64, 65, 77, 84
— intranatal, 9
— intrapartum, birth injuries causing, 8
— intra-uterine, 48-50, 107, 108
— maternal, acute yellow atrophy causing, syphilis and, 80
—— anesthesia causing, acidosis and, 130, 131
—— asepsis and, 86
—— cesarean section and, 92

Death, maternal, conception causing, frequency of, 6
— — eclampsia and, 39, 92
— — midwives' responsibility for, 153
— — milk leg and, 94
— — miscarriage and, 47
— — obstetrical technic and, 150
— — placenta and, manual removal of, sepsis in, 97
— — prenatal care and rate of, 10-13, 90
— — puerperal sepsis and, 4, 86, 90, 101, 104
— — rates, 2-5
— — sepsis and rate of, 98
— — shock at labor and, 130, 131
— — thrombophlebitis and, 104
— neonatal, 2, 8, 12, 63, 79, 111, 121
— postnatal, 9
— stillbirth, autopsy of, 9
— — breech deliveries and, 117
— — Census reports, 2
— — cerebral hemorrhage and, 112
— — frequency of conception and, 6
— — history of patient, 17
— — reduction of, prenatal care and, 10, 12, 81, 82, 84
— — spinal injuries and, 121
— — syphilis and, 63, 64, 77, 79, 81, 82, 84
— — traumatism at labor and, 111
Decidua, colon bacillus infection causing, 89
Decompensation, pregnancy and labor, treatment of, 32, 33
Deformities, fetal death due to, 9
—hereditary syphilis and, 67
— structural, fetus and, 67
Delivery, abruptio placentæ and, 56
— accidents at, 4, 7, 8, 9, 130-135
— acidosis at, 91, 130-133
— anesthesia during, 109, 169
— — convulsions in, 38
— — deaths with, acapnia and acidosis causing, 130, 131
— — infection caused by, 91
— — rectal, cardiac cases and, 33
— — tuberculosis and, 29
— aseptic preparations at, 86, 95, 109
— blood-pressure during, shock and, 131
Delivery, bougie method at, 110
— breech, 8, 56, 60, 111, 117, 118, 121, 123, 131, 136
— — technic of, 128
— convulsions at, 4, 10, 36, 48, 116
— — treatment of, 38, 39
— dangers of, 150
— decompensation in treatment of, 32, 33
— dystocia in, 19, 41
— exhaustion at, breast milk and, 141
— forceps delivery, birth palsy in, 125
— — cardiac cases and, 32, 33
— — clavicular fracture in, 121
— — conservatism in, 19
— — convulsions after, 116
— — falx and tentorium ruptured in, 117
— — feeble-mindedness and, 111, 112
— — hematoma and, 125
— — hemorrhages in, bulbar and medullary, 120
— — lacerations and, 89
— — placenta prævia and, 60
— — skull injuries in, 116
— hemorrhage during, 91, 150
— — brain, newborn, 139
— — central nervous system, death at birth and, 118, 119, 120
— — cerebral, newborn, 111, 112, 113, 137, 150
— — cerebrospinal, breech deliveries and, 117
— — dural, birth injuries and, 113
— — induction and, premature labor, 107
— — intracranial at birth, 111, 120
— history of patient and, 17
— hospital delivery, 5, 90, 157, 158, 162
— — sepsis in, 5, 90
— inertia and, 91
— infections during, 91, 86-105
— — abortion and, 6, 43, 47
— — bacteriology of, 87
— — blood transfusion and, 103, 104
— — Census reports of, 2
— — charts, illus., 100, 102
— — chemical treatment of, 104
— — eclampsia and, 92
— — endometritis and, 93

Delivery, infections during, frequency of, 90
— — gonococcus causing, 61, 94
— — hygienic prevention of, 95, 96
— — leukocyte count in, 101
— — maternal deaths due to, 86
— — metritis and, 93
— — midwife's responsibility in, 153
— — miscarriage and, 47
— — mortality rates of, 90
— — operative treatment of, 91, 104
— — pathology of, 88
— — placental, 91, 94
— — predisposing causes of, 91
— — prenatal care and, 5, 12
— — protein therapy and, 103
— — serums in, 99-103
— — specific treatment of, 99
— — Staphylococcus aureus causing, 87
— — streptococcus causing, 87
— — symptomatology of, 93
— — thrombophlebitis and, 94
— — thrombosis and, 89
— — treatment of, 95-104
— injuries at, 111, 112
— — cephalic, 8, 112
— — clavicular, 121, 123, 127
— — extremities and, 121
— — infant death due to, 7, 8,
— — intrapartum, 111-129
— — nerves and, 124
— — obstetrical management and, 8
— — spinal, 117
— instructions, 95, 169
— lacerations at, 45, 88, 91
— — repair of, 89, 97
— mania at, acute, 40
— midwife's service at, 151-154
— operative delivery, 91, 104
— — death from sepsis in, 90, 91
— — dystocia and, 19
— — inertia necessitating, 91
— — infections following, 87, 90, 91, 104
— — injuries in, 111, 128
— — pelvic examination and, 19
— — shock prevention and, 19
— pains at, 109, 169
— — abruptio placentæ and, 54, 55
— — acute cystoma and, 42
Delivery, pains at, breast feeding and, 140
— — fibromyomata and, 44
— — heart, 30, 31
— — lower back, 169
— — neuralgic, toxemias and, 37
— — premature imitation of, 109
— — prenatal care and, 45
— pelvic measurements at, 18
— placenta prævia and, 60
— premature, cardiac cases and, 33
— — conservatism and, 19
— — death in utero prevented by, 49
— — induction of, 106-110
— — prenatal care preventing, 12, 15, 149
— — syphilis causing, 79
— — uterine myomata and, 42
— prenatal care and, 12, 15, 149
— public health measures, protection of mother and child and, 150-175
— rubber bags and, 108
— sepsis causing deaths at, 4
— shock following accidents of, 130-135
— — primary, 131
— — secondary, 133
— shoulder delivery, 121, 122, 123, 128
— — fractures in, 127
— — subluxation in, birth palsy due to, 124
— — technic of, 128
— stillbirths at, autopsy of, 9
— — breech deliveries and, 117
— — causes of, 8
— — Census reports of, 2
— — cerebral hemorrhage and, 112
— — frequency of conception and, 6
— — history of patient and, 17
— — reduction of, prenatal care and, 10, 12, 81, 82, 84
— — spinal injuries and, 121
— — syphilis and, 63, 64, 77, 79, 84
— — tears and, falx and tentorium, 117
— — traumatism and, 111
— supplies for, 170
— tamponage in, 110
— toxemia and, 131
— tuberculosis and, 29
— tumors at, 18, 41-44, 45

Delivery, uterine myomata and, 42
— version, 120, 121, 131
—— abortion and, 43
—— Braxton-Hicks, placenta prævia and, 60
—— cardiac cases and, 33
—— collapse in, 131
—— conservatism and, 19
—— decompensation and, 32
—— internal podalic, placenta prævia and, 60
—— spinal injuries, 120, 121
— vertex, 117, 121
— Wassermann reaction at, 76
Dentistry, pregnancy and, 166
Depression, mental, pregnancy and, 39, 169
Dermatitis, exfoliative, newborn, syphilitic pemphigus confused with, 75
Dermoid cysts, ovariotomy and, 41, 43
Desserts, diet of pregnancy and, 23
Dextrimaltose, infant feeding and, 146
Diapers, infant, care of, 172
Diaphysis, lesions, syphilitic infants and, 71, 78
Diet, pregnancy, 21, 22-25, 164
—— breast milk and, 143
—— constipation and, 166
—— sepsis and, 98
—— toxemias and, 37
Digestion, pregnancy and, 24
Digitalis, acute decompensation during pregnancy treated with, 32
Dilatation, cervix uteri, labor and, 89, 96
—— artificial, puerperal infections due to, 91
—— premature induction of, 109
—— rubber bags used in, 32
Discharge, bloody, prenatal care and, 46
Dislocations, birth, 127
District nurses, maternity protection and, 155, 156, 159
Dizziness, pregnancy and, 168
— toxemias and, 37
Donors, blood transfusion, obstetrical services and, 104
Douches, abortion and, 48
Douches, alcohol, puerperal infections contraindicating, 99
—gonorrhea and, 61
— lysol, premature cases and, 109
— pitcher, after labor, 95
—-vaginal, delayed labor and, 96
Drainage, labor and, 97
— puerperal infections and, 98, 99
Dressings, sterile, puerperal infections and, 87
Dried milk preparations, infant feeding and, 146
Driving, pregnancy and, 24
Dropsy, pregnancy and, heart failure in, 30
Dublin treatment, convulsions at labor and, 39
— head indentations and, 113
Duchenne's paralysis, 123, 124
Dural hemorrhage, birth injuries and, 113
Dural septum, tears of, infant death and, 117
Dystocia, cysts and tumors causing, ovarian, 41
— operative delivery and, 19
Dystrophies, infant, hereditary syphilis and, 66

Ears, infant, congenital syphilis affecting, 76
Eclampsia, pregnancy and, acidosis and, 130
—— Dublin treatment of, 39
—— maternal death-rate due to, 4
—— prenatal care in, 10, 39
—— puerperal sepsis following, 92
—— shock in, 130
—— toxemia of, 131
—— Stroganoff treatment of, 38
Ectopic pregnancies, ruptured, shock and, 133
Edema, newborn and, brain of, 137
—— epiphyseal junction of, 63, 72, 127
—— scalp of, 112
—— syphilitic and, liver tissues of, 74
— eclampsia and, 39
— lungs and, pregnancy and, 30, 32
— placenta and, syphilitic, 68

Edema, toxemias of pregnancy and, 37
Education, prenatal care and, 12, 15, 149-175
Eggnog, whiskey, septic patients and, 98
Eggs, diet of pregnancy and, 23, 165
Eiweiss milk, infant feeding and, 145
Elimination, faulty, pregnancy and, 22
Embolism, cerebral and pulmonary, labor and, 11, 33
Embryo development, abortions and, 45
— hereditary syphilis and, 66
Employment, prenatal care and, 156
Endocarditis, pregnancy and labor in, 29, 33, 34
Endocrine changes, pregnancy and, 40
Endometritis, abruptio placentæ and, 52
— bacteria causing, 88
— intercourse causing, 95
— puerperal infections causing, 89
— staphylococcus infections and, 104
— symptoms of, 93, 94
Endometrium, changes in, fetal death and, 48
Enemas, feeding by, nausea and, 26
— soapsuds, 25, 169
Environment, breast feeding and, 139
— syphilis and, 77
Epiphyseal line conditions, newborn, 124, 127
— arm fractures and, 123
— edema at, simulating antenatal syphilis, 63, 72
— osteochondritis at, syphilitic infants and, 70-73
— x-ray of, test for congenital syphilis and, 78
Epsom salts, eclampsia and, 39
Erb's paralysis, 123, 124
Ergot, sapremia treated with, 93
Eructations, infant feeding and, 145
Eruptions, syphilitic, neonatal period and, 75
Erysipelas, puerperal infections originating in, 86
Ether, labor and, 169
— cardiac cases and, 33
— convulsions and, 38
Ether, seminarcosis per rectum, labor of the tuberculous and, 29
Ethylene, anesthesia of the tuberculous at labor and, 29
Examination, abortion and, 46
— manual, elimination of, 96
— postpartum, 160
— prenatal care and, 15, 16, 17
— vaginal, infections following, 87
Excitement, heart conditions during pregnancy and, 32
Exercise, pregnancy and, 24, 168
— heart conditions in, 32
Exertion, breast milk and, 144
Exhaustion, labor, breast feeding and, 141
Exhibits, public health, prenatal and infant care and, 157
Exsanguination, delivery and, 91
— — blood transfusion in, 104
— — Credé expression causing, 97
— infant, 112
— placenta prævia and, 60
Extrasystoles, respiratory, pregnancy and, 31
Extremities, injury to, birth, 121
Eyes, infant's, care of newborn, 62, 137, 169
— — congenital syphilis and, 76
— — gonococcal infection and, 62, 94
— — prenatal care and, 16
— pregnancy and, 168
— — toxemias of, 37

Facial paralysis, newborn, 125, 127
Facial puffiness, pregnancy and, 168
Factory legislation, prenatal care of pregnant mothers and, 24, 156
Faintness, abruptio placentæ and, 54
Falls, abortion and, 45
Falx cerebri, tears of, birth, 112, 113
— illus., 115, 118
— infant death caused by, 117
Family psychology, induction of labor and, 110
Father, education of, maternity protection and, 156
— health of, abortions and, 45
— —fetal death and, 48
— responsibility of, 3

Father, size of, fetal size and, 19
— syphilitic infection of fetus through, 64, 66, 81
Fatigue, abortion and, 44
— breast milk and, 141, 144
Fat indigestion, infant feeding and, 145
Fear, pregnancy and labor and, 17, 40, 51, 169
Feeble-mindedness, difficult labor and, 112
— forceps delivery and, 111
Feeding, artificial, danger of, 157
— bottle, 140, 141, 145
— breast, 139-148, 173, 174
— complementary, 145, 146
— cod-liver oil in, 146
— formula, sepsis and, 98
Feet, swelling of, pregnancy and, 162, 168
Femur, syphilis at, illus., 73, 74
Ferric chlorid, gonorrheal condylomata treated with, 61
Fetal abnormalities, 48, 49
— prenatal care and, 8
Fetal movements, cessation of, pregnancy and, 50, 169
— abruptio placentæ and, 55
— death in utero and, 108
Fetal syphilis, 49
Fetus, macerated, 48, 49
— — syphilitic lesions at epiphyseal junction in, 72
— oversize of, 19
— — premature labor and, 107, 108
Fibrillation, auricular, death from, labor and, 33
Fibromyomata, abruptio placentæ and, 52
— prenatal care and, 42
— removal of, 43
Fibrosis syphilitic infants and, liver of, 74, 75
— syphilitic osteochondritis and, 72
— syphilitic placenta and, 68
Figs, constipation during pregnancy and, 166
Fish, diet of pregnancy and, 23
Flannels, baby, care of, 172
Foods, uses of, pregnancy and, 165
Forceps delivery, birth palsy in, 125
Forceps delivery, cardiac cases and, 32, 33
— clavicular fracture in, 121
— conservatism in, 19
— convulsions after, 116
— falx and tentorium ruptured in, 117
— feeble-mindedness and, 111, 112
— hematoma and, 125
— hemorrhages in, bulbar and medullary, 120
— — illus., 122
— lacerations and, 89
— placenta prævia and, 60
— skull injuries in, 116
Formalin, urine analysis and, 22
Formula feeding, 140
Fowler position, drainage after labor and, 97
— pyelitis of pregnancy and, 35
Fractures, birth, arm, 123
— — clavicular, 121, 123
— — paralysis and, 127
— — treatment, illus., 123
Fright, acidosis in labor and, 131
Frontal bone, birth injuries of, 113
Fruits, diet of pregnancy and, 23, 165
— toxemias and, 37

Gangrene, bacteremia causing, 94
Garters, pregnancy and, illus., 163
Gas-oxygen, labor anesthesia of the tuberculous and, 29
Gatch bedspring, drainage cases and, 97
Genital tract, pregnancy and labor and, hygiene of, 95
— lacerations and repair of, 97
Gentian violet, gonorrhea treated with, 61
—staphylococcic puerperal infections treated with, 104
Germ-plasm, prenatal care and, 8
— syphilis transmitted by, 64
Gestation, abnormalities of, 17
— abscesses in, 35, 88
— accidents of, maternal death-rate in, 4
— acidosis in, 130, 131
— after-care of, 28
— albuminuria in, 4, 21, 35, 37, 38, 49

Gestation, asepsis of, 86, 95, 96
— blood-pressure and, 22, 160, 162
— breast hygiene in, 141, 157
— civic protection of mothers during, 17, 155
— clothes for, 162
— constipation during, 166
— convalescence and, 160
— cysts and, ovary, 41
— danger signals of, 168
— deaths due to, maternal, 2, 5
— diet of, 22-25, 164
— digestion and, 24
— ectopic, secondary shock and, 133
— examination of, 17-22, 160
— exercise during, 168
— — corrective, 160, 161
— heart disease and, 29-34
— hemorrhage in, 50
— — calcium in prevention of, 139
— gonococcal infection during, 88
— — treatment of, 61, 62
— hygiene of, 28, 95, 156
— instructions and, labor, 160, 161, 170
— intestinal care and, 25
— kidney conditions and, 21, 166
— legislation regulating employment during, 156
— liver conditions of, 21
— medical complications of, 25-62
— menstruation periods during, 162
— miscarriages, prevention of, 162
— mitral stenosis and, 30, 32
— nausea of, 25, 26, 168
— nervous disorders and, prenatal care in, 39-41
— nipples in, care of, 141
— placenta prævia and, 56-61
— postural treatment in, 19, 20, 35, 161, 168
— psychoses and, 39, 107, 169
— pyelitis and, 34-36
— pyelonephritis and, 35
— rest during, 21, 24, 32, 46, 47, 142, 161, 162, 167
— skin during, care of, 167
— supervision plan during, 16, 161, 169, 170
— supplies for, 170
— syphilis in, 63-84
Gestation, teeth during, care of, 166
— termination of, 18, 47
— — cardiac disease and, 31, 33
— — nervous disorders and, 40
— — pyelitis and, 36
— — syphilis and, 79
— — tuberculosis and, 28, 80-84
— toxemias of, abruptio placentæ and, 52
— — acidosis with, 130-133
— — chronic, high blood-pressure in, 22
— — convulsions and, 10
— — death in utero caused by, 107
— — fetal death and, 9, 48
— — intestinal care and, 25
— — maternal deaths due to, 4, 5, 11
— — nausea and vomiting in, 25
— — placental separation and, 55
— — premature labor induction in, 107, 131
— — prenatal care and, 10, 11, 15, 16, 36-39, 150
— — puerperal infections due to, 91
— — shock at labor caused by, 130, 131
— — syphilis and, 75, 80
— — Wassermann reaction in, 76
— tuberculosis and, 26-29
— — treatment, 27
— tumors and, ovary, 41
— urinalysis and, 21, 160, 162
— uterine myomata and, 42
— vaginal smear and, 160
— varicose veins and, 167, 168
— Wassermann reaction in, 76, 77, 160
— — chart, 69
— weight during, 24
Ginger ale, nausea and, 25
Glucose injections, rectal, toxemias and, 37
— intravenous, nausea and, 26
— — toxemias and, 131
Golf, pregnancy and, 24
Gonorrhea, pregnancy with, 88
— abortion and, 45
— premature labor contraindicated in, 106
— prenatal care in, 15, 16

Gonorrhea, symptomatology of, 94
— treatment of, 61, 62
Grapefruit, diet of pregnancy and, 165
Graves' disease, pregnancy and, 6, 18
Green soap, vaginal examination and, 160
Group medicine, rural, 159
— midwifery and, 154
Gum-acacia emulsion, placenta prævia cases treated with, 61
Gum glucose, infusion apparatus for, illus., 135
— transfusion of, shock following labor and, 134
Gynecology, teaching of, 150

Habits, infant, regulation of, 174
Hands, swelling of, pregnancy and, 168
Head, fetal, breech delivery and, 117, 121
— — diagrams, illus., 115
— — injuries at birth to, 112, 113, 121
— — pelvis and, 128
— — position of, 96
— — toxemias and, 37
Health, public, prenatal care and, 149-175
— — baby stations for, 156
— — rural centers for, 159
Heart, disease of, pregnancy and, 6, 29-34
— — abruptio placentæ and, 52
— — after-effects of, 33
— — history and, patient's, 17
— — prenatal care and, 31, 32
— — tachycardia distinguished from, 33
— — treatment of, 31
Heart failure, symptoms of, pregnancy and, 30
Heart lesions, newborn and, 137
Heart murmurs, pregnancy and, 30, 31
Hematoma, forceps deliveries and, 125
Hematopoietic cells, liver of syphilitic infants and, 74, 75
Hemoglobin, abruptio placentæ and, 56
Hemolytic organisms, bacteremia and, 94
Hemophilia, newborn and, 138
— — treatment, 139
— pregnancy with, calcium medication for, 23
Hemorrhage, abortion and, 43
— abruptio placentæ and, 52-56
— accidental, blood transfusion in, 103, 104
— — cardiac cases and, 33
— — placenta prævia distinguished from, 56
— — secondary shock and, 133
— — sepsis and, 91, 103
— brain, newborn, 139
— — facial paralysis and, 127
— — injuries and, 111, 137
— bulbo-medullary, 118, 119, 120
— central nervous system, death at birth and, 118, 119, 120
— cerebral, breech delivery and, 114
— — infant deaths due to, 111
— — newborn, 113, 137, 150
— — operative delivery and, 114
— — prematurity and, 114
— — spinal puncture in, 138
— — spontaneous delivery and, 114
— — stillbirths and, 112
— cerebrospinal, breech deliveries and, 117
— dural, birth injuries and, 113
— fetal tendencies to, 48
— history of patient and, 17
— idiopathic tendency to, newborn, 138
— intracranial at birth, 120
— — stillbirths and, 111
— labor and, premature, induction of, 107
— lacerations and, prevention of, 97
— placental, Credé expulsion causing, 97
— — fetal death due to, 9
— placenta prævia and, 56-61
— postpartum, 11, 97, 130
— — chart, illus., 134
— prenatal care and, 12, 15, 16, 49
— prevention of, newborn and, calcium treatment in, 139
— puerperal infections and, 91
— — maternal death-rate due to, 4
— retroplacental, 53, 55

Hemorrhage, retroplacental, death in utero and, 107
— spinal cord, newborn, 117, 120, 122
— subdural cerebral at birth, 117
Hereditary syphilis, bone necrosis and, newborn and, 72
— pregnancy and, 66-78
Heredity, hemorrhage and, newborn and, 138, 139
— infant death during first year and, 8
Herxheimer's reaction, avoidance of, treatment of congenitally syphilitic infants and, 83
History, pregnant patient's, 17
Horseback riding, pregnancy and, 24, 168
— abortion and, 45
Horse serum, streptococcic infections of animals and, 101
Hospital maternity service, 152, 158
— abnormal cases and, 158, 162
— abortions and, 47
— deliveries and, 5, 90, 157, 158, 162
— midwifery and, 152, 154
— nurses and, 155
— placenta prævia cases and, 60
— puerperal infections in, 90
— rural, 159
— sepsis in, 5
Housework, pregnancy and, 168
Humerus, subluxation of, birth palsy caused by, 125
Hunger cry, breast milk and, 145
Hutchinson's teeth, congenital syphilis and, 70
Hygiene, pregnancy, instruction of public in, 156
— nursing, 140
— prenatal, 10
— sepsis prevention and, 95
— tuberculosis and, 28
Hypodermoclysis, abruptio placentæ and, 56
— placenta prævia and, 60
Hysterectomy, pregnancy and, 42
— abruptio placentæ and, 56
— puerperal sepsis and, 104
Hysterotomy, tuberculous women and, 29
Idiocy, infant, instrumental birth and, 111
— prolonged labor and, 112
Immaturity, early infant death caused by, 6
— fetal death due to, 9
"Imperial" drink, toxemias of pregnancy and, 37
Indican, pyelitis cases and, 35
— urine of pregnancy and, 21
Indigestion, pregnancy and, 164
— fat causing, infant feeding and, 145
Induction, premature labor, 106-110
— gonorrhea prohibiting, 61
— methods of, 108
Inertia, labor and, 91
Infant, death of, age rates of, 7, 8
— — breast feeding and, 140
— — causes of, 7, 149
— — congenital causes of, 14
— — early, causes of, 6, 7
— — enlarged thymus and, 138
— — factory day nurseries and, 156
— — falx and tentorium rupture causing, 117
— — hemorrhages causing, central nervous system, 118, 119, 120
— — prenatal care and, clinical reports of, 10-13
— — seasonal, 4
— — sepsis causing, 98
— — spinal injuries causing, 121
— — syphilis causing, 7, 64, 65, 77, 84
— deformities of, 9, 67
— feeding of, artificial, danger of, 157
— — bottle, 140, 141, 145
— — breast, 139-148, 173, 174
— — complementary, 145, 146
— — cod-liver oil in, 146
— — formula, sepsis and, 98
— health stations for, 156
— newborn, abnormalities, 137, 138, 149
— — care of, 8, 136-139, 171-174
— — clothes and supplies for, 169, 171
— — crying of, 137, 145
— — eyes of, care of, 62, 137, 169
— — hemorrhages of, central nervous system, 118, 119, 120
— postnatal examination of, 160

Infant, premature, breast milk supply for, 157
— — prenatal care and, 7
— — syphilis and, 79
— syphilitic infection of, 63-66, 76
— — osteochondritis and, 70-73
— — treatment of, 81-83
— — Wassermann reaction and, 78
Infections, labor, 86-105
— puerperal, 86-105
— — abortion and, 6, 43, 47
— — bacteriology of, 87
— — blood transfusion, dosage, 103, 104
— — Census reports of, 2
— — charts, illus., 100, 102, 114
— — chemical treatment of, 104
— — eclampsia and, 92
— — endometritis and, 93
— — frequency of, 90
— — gonococcus causing, 61, 94
— — hygienic prevention of, 95, 96
— — labor followed by, 150
— — leukocyte count in, 101
— — maternal deaths due to, 4, 5, 11, 86
— — metritis and, 93
— — midwives' responsibility in, 153
— — miscarriage and, 47
— — mortality rates in, 90
— — operative treatment of, 91, 104
— — pathology of, 88
— — placental, 91, 94
— — predisposing causes of, 91-95
— — prenatal care and, 5, 12
— — protein therapy and, 103
— — serums in, 99-103
— — specific treatment of, 99
— — Staphylococcus aureus causing, 87
— — streptococcus causing, 87
— — symptomatology of, 93
— — thrombophlebitis and, 94
— — thrombosis and, 89
— — treatment of, 95-104
Influenza, fetal death and, 48
— history of patient and, 17
Infraspinatus, paralysis of, birth, 125
Injuries, birth, cephalic, 8, 112
— — clavicular, 121, 123, 127
— — early infant death to, 7, 8
Injuries, birth, extremities and, 121
— — intrapartum, 111-129
— — nerves and, 124
— — obstetrical management and, 8
— — spinal, 117
— fetal death due to, 9
Insanity, puerperal, 40
Institutions, maternity, prenatal care and, 155, 156
Insulin injections, nausea of pregnancy and, 26
Insurance, maternity, 156
Intercourse, pregnancy and, sepsis caused by, 95
— — abortion and, 45
— — retrodisplacement and, 20
Intestines, care of, pregnancy and, 21, 25
— convulsions and, 37
— heart conditions and, 32
— pyelitis and, 34, 35
Intracephalic lesions, early infant death and, 8
Intracranial pressure, birth, blood injections in, 115
— drainage by lumbar puncture in, 113
— facial paralysis and, 127
— head injuries and, 113, 115
— hemorrhage and, 117, 120
Intranatal syphilis, fetal death due to, 63
Intrapartum birth injuries, 111-129
— death caused by, 8
— extremities and, 121
— head and, 112
— nerves and, 124
— spinal cord and, 117
— vertebra and, 117
Intra-uterine death, 48-50, 107, 108
Invalidism, poor obstetrics and, 150
Iodin, asepsis of labor and, 96, 109.
Iodoform tamponage, 56
— abortion and, 29, 48
— placenta prævia and, 59
Iritis, puberty and, congenital syphilis and, 76
Irrigations, colonic, bicarbonate of soda, nausea and, 25
— — pyelitis and, 34, 35, 36

Irrigations, colonic, toxemias and, 37
— kidney pelvis, pyelitis and, 36
— uterus, septicemia caused by, 90
Irritation, pregnancy and, 101
— — toxemias of, 37

Joints, septic, thrombophlebitis causing, 94

Karrel diet, toxemias of pregnancy and, 37
Keratitis, puberty and, congenital syphilis and, 76
Kerr treatment, head indentations and, 113
Kidney conditions, pregnancy and, 18
— — care of, 32, 166
— death in utero and, 107
— eclampsia and, 39
— history and, patient's, 17
— puerperal sepsis and, 91
— pyelitis and, 34, 35
— urine analysis and, 18, 21, 160, 162, 166
Knee-chest position, misplacements prevented by, 19, 161
— pyelitis and, 35
Krause method, bougie introduction by, 110

Labor, abruptio placentæ and, 56
— accidents at, 4, 7, 8, 9, 130-135
— acidosis at, 91, 130-133
— anesthesia during, 109, 169
— — convulsions in, 38
— — deaths with, acapnia and acidosis causing, 130, 131
— — infection caused by, 91
— — rectal, cardiac cases and, 33
— — tuberculosis and, 29
— aseptic preparations at, 86, 95, 109
— blood-pressure during, shock and, 131
— bougie method at, 110
— breech delivery, 8, 56, 60, 111, 117, 118, 121, 123, 131, 136
— — technic of, 128
Labor, convulsions at, 4, 10, 36, 48, 116
— — treatment of, 38, 39
— dangers of, 150
— decompensation in, treatment of, 32, 33
— dystocia in, 19, 41
— exhaustion at, breast milk and, 141
— forceps delivery, birth palsy in, 125
— — cardiac cases and, 32, 33
— — clavicular fracture in, 121
— — conservatism in, 19
— — convulsions after, 116
— — falx and tentorium ruptured in, 117
— — feeble-mindedness and, 111, 112
— — hematoma and, 125
— — hemorrhages in bulbar and medullary, 120
— — lacerations and, 89
— — placenta prævia and, 60
— — skull injuries in, 116
— hemorrhage during, 91, 150
— — brain, newborn, 139
— — central nervous system, death at birth and, 118, 119, 120
— — cerebral, newborn, 111, 112, 113, 137, 150
— — cerebrospinal, breech deliveries and, 117
— — dural, birth injuries and, 113
— — induction and, premature labor, 107
— — intracranial at birth, 111, 120
— history of patient and, 17
— hospital delivery, 5, 90, 157, 158, 162
— — sepsis in, 5, 90
— inertia and, 91
— infections during, 91, 96-105
— — abortion and, 6, 43, 47
— — bacteriology of, 87
— — blood transfusion and, 103, 104
— — census reports of, 2
— — charts, illus., 100, 102, 114
— — chemical treatment of, 104
— — eclampsia and, 92
— — endometritis and, 93
— — frequency of, 90
— — gonococcus causing, 61, 94
— — hygienic prevention of, 95, 96

Labor, infections during, leukocyte count in, 101
— — maternal deaths due to, 86
— — metritis and, 93
— — midwives' responsibility in, 153
— — miscarriage and, 47
— — mortality rates of, 90
— — operative treatment of, 91, 104
— — pathology of, 88
— — placental, 91, 94
— — predisposing causes of, 91
— — prenatal care and, 5, 12
— — protein therapy and, 103
— — serums in, 99-103
— — specific treatment of, 99
— — Staphylococcus aureus causing, 87
— — streptococcus causing, 87
— — symptomatology of, 93
— — thrombophlebitis and, 94
— — thrombosis and, 89
— — treatment of, 95-104
— injuries at, 111, 112
— — cephalic, 8, 112
— — clavicular, 121, 123, 127
— — extremities and, 121
— — infant death due to, 7, 8
— — intrapartum, 111-129
— — nerves and, 124
— — obstetrical management and, 8
— — spinal, 117
— instructions, 95, 169
— lacerations at, 45, 88, 91
— — repair of, 89, 97
— mania at, acute, 40
— midwife's service at, 151-154
— operative delivery, 91, 104
— — death from sepsis in, 90, 91
— — dystocia and, 19
— — inertia necessitating, 91
— — infections following, 87, 90, 91, 104
— — injuries in, 111, 128
— — pelvic examination and, 19
— — shock prevention and, 19
— pains at, 109, 169
— — abruptio placentæ and, 54, 55
— — acute cystoma and, 42
— — breast feeding and, 140
— — fibromyomata and, 44
— — heart, 30, 31
Labor, pains at, lower back, 169
— — neuralgic, toxemias and, 37
— — premature imitation of, 109
— — prenatal care and, 45
— pelvic measurements at, 18
— placenta prævia and, 60
— premature, cardiac cases and, 33
— — conservatism and, 19
— — death in utero prevented by, 49
— — induction of, 106-110
— — prenatal care preventing, 12, 15, 149
— — syphilis causing, 79
— — uterine myomata and, 42
— prenatal care and, 12, 15, 149
— public health measures, protection of mother and child and, 150-175
— rubber bags and, 108
— sepsis causing deaths at, 4
— shock following accidents of, 130-135
— — primary, 131
— — secondary, 133
— shoulder delivery, 121, 122, 123, 128
— — fractures in, 127
— — subluxation in, birth palsy due to, 124
— — technic of, 128
— stillbirths at, autopsy of, 9
— — breech deliveries and, 117
— — causes of, 8
— — census reports of, 2
— — cerebral hemorrhage and, 112
— — frequency of conception and, 6
— — history of patient and, 17
— — reduction of, prenatal care and, 10, 12, 81, 82, 84
— — spinal injuries and, 121
— — syphilis and, 63, 64, 77, 79, 84
— — tears and, falx and tentorium, 117
— — traumatism and, 111
— supplies for, 170
— tamponage in, 110
— toxemia and, 131
— tuberculosis and, 29
— tumors at, 18, 41-44, 45
— uterine myomata and, 42
— version delivery, 120, 121, 131
— — abortion and, 43

Labor, version delivery, Braxton-Hicks, placenta prævia and, 60
— — cardiac cases and, 33
— — collapse in, 131
— — conservatism and, 19
— — decompensation and, 32
— — internal podalic, placenta prævia and, 60
— — spinal injuries, 120, 121
— vertex delivery, 117, 121
— Wassermann reaction at, 76
Lactation, preparation for, 139-148
Lactose, infant feeding and, 146
Languor, newborn, 137
Larynx, tuberculosis of, pregnancy and, 27, 28
Latissimus dorsi, paralysis of, birth and, 125
Laughing gas, labor and, 169
Lavage, eclampsia and, 39
Laxatives, pregnancy and, 25
Lead nipple shields, 143
Leg, fractures of, newborn, 124
— milk, thrombophlebitis causing, 94
Legislation, factory, prenatal care and, 156
Leukocyte count, puerperal infections and, 93, 94, 101
Levaditi method, spirochete in liver of syphilitic infants shown by, 75
Limewater, teeth with, care of, 166
Liquor amnii, fetal death in utero and, 50
— newborn and, 136
Liver, circulation of, newborn, 138
— conditions of, pregnancy and, 21
— enlargement of, heart failure and, 30
— — spleen enlargement and, syphilis and, 75
— gumma of, illus., 92
— sepsis and, 92
— syphilis and, 75, 80
— syphilitic infants and, 73-75
Living conditions, infant mortality and 3, 4
Lobsters, contraindicated in diet of pregnancy, 24
Lochia, colon bacillus infection producing, 88
— endometritis and, 93
Lochia, infectiousness of, 86
— postpartum care of, 161
— puerperal sepsis and, 93
Lumbar puncture, intracranial pressure at birth and, 113
Luminol, tachycardia and, 33
Lungs, edema of, pregnancy and, 32
— — heart failure and, 30
— newborn, 136
Lutein injection, nausea of pregnancy and, 25
Lysol, pregnancy and labor and, 108, 109, 160

Magnesia, milk of, teeth with, care of, 166
— nausea and, 25
Maceration, fetal death and, 48
— syphilitic infants and, 75
Maculopapular skin lesions, syphilitic infants and, 75
Malformations, birth, hereditary syphilis and, 67
— — infant care due to, 7
Mammary glands, 140
Mania, acute, pregnancy and, 40
Manipulation, obstetrical, infections following, 87, 88, 90, 91
Marital relations, abortion and, 45
— postpartum care and, 161
— retrodisplacement and, 20
— sepsis and, 95
— syphilitics', regulation of, 67, 81
Mastitis, treatment of, 147
Maternal death, acute yellow atrophy causing, syphilis and, 80
— anesthesia causing, acidosis and, 130, 131
— asepsis and, 86
— cesarean section and, 92
— conception causing, frequency of, 6
— eclampsia and, 39, 92
— midwives' responsibility for, 153
— milk leg and, 94
— miscarriage and, 47
— obstetrical technic and, 150
— placenta and, manual removal of, sepsis in, 97
— puerperal sepsis and, 4, 86, 90
— — mercurochrome injections in, 104

Maternal death, puerperal sepsis and serum treatment of, 101
— rates of, 2-5
— — causes of, 4
— — prenatal care and, 10-13, 90
— — sepsis and, 98
— — toxemias and, 4
— shock at labor and, 130
— — acidosis in, 131
— thrombophlebitis and, 104
Maternal welfare movement, 153, 154, 174, 175
Maternity Center Association of N. Y., exhibit, illus., 173
— prenatal care by, 11-13
Maternity clothes, 162
Maternity corsets, 163
— illus., 164
— prenatal care and, 15
Maternity hospital service, 157, 158
Maternity nursing, 157, 161, 165, 174
— factory day nurseries and, 156
— prenatal care and, 10
— public health and, 157
— training for, 159
Maternity protection, public health aspect of, 150-175
— campaign in New York City, 155
Measles, fetal death and, 48
Measurements, pelvic, prenatal care and, 18
Meat, diet of pregnancy and, 23, 165
Medical care, need for improvement in, childbirth and, 150-154
Medical complications, pregnancy and, 5, 25-62
Medical examination, pregnant patient and, 17
Medical supervision plan, pregnant patient and, 161
Medical teaching, improvement in, maternal protection and, 150
Medullary hemorrhages, newborn, 118, 119, 120
Melancholia, acute, pregnancy and, 40
Membranes, rupture of, infection following, 96
Meningocele, hereditary syphilis and, 67
Menstruation period, abortion and, 6, 45
— rest at, pregnancy and, 162
Mental conditions, pregnancy and, 39, 40, 169
— eclampsia and, 39
Mental deficiency, instrumental birth and, 111, 112
Mercurochrome injections, puerperal infection and, 104
Mercury, chlorid of, congenital syphilis treated with, 83
— gonorrhea with, pregnant treated for, 62
— inunction, contraindicated in newborn, 83
— syphilis with, pregnant treated for, 80, 84
— — dosage, 80
— toxemias contraindicating, 80
Metaphysis, fibrosis of, syphilitic osteochondritis and, 72
Metritis, symptomatology of, 93
Midwifery practice, 151-154
— anesthetics in, 170
— birth injuries and, 127
— births in, percentage of, 152
— dangers of, 149
— elimination of, 154, 157
— maternal mortality and, 153
— nurses' training in, 159
— prenatal care and, 10, 154
— state supervision of, 152, 153, 154
Milk, breast, 139-148
— diet in pregnancy and, 23, 165, 166
— — tuberculous cases and, 28
— infant feeding and, 146
— injections of, puerperal sepsis and, 103
Milk leg, thrombophlebitis causing, 94
Mineral oil, infant care and, 172
Miscarriage, after-care, 28
— artificial, 6, 18, 29, 42
— cardiac cases and, 33
— criminal, 6, 45
— death from, 47
— fibromyomata and, 42
— gonorrhea and, 61
— myomata and, uterine, 42
— ovariotomy and, 41
— patient's history of, 17
— prenatal care and, 2, 7, 12, 44-48
— prevention of, 162
— retrodisplacements and, 20

Miscarriage, septic uterus following treatment of, 90
— syphilis and, 77, 78
— — pregnant mothers treated for, 82
— tubal infections and, 6
— tuberculosis and, 29
— tumors of uterus and, 42
Misplacements, uterine, prevention of, 160, 161
Mitral stenosis, pregnancy and, 30, 31, 32
Modern social life, pregnancy and, 24
— nursing mothers and, 139
— prenatal care and, 1
Monkey trot exercise, misplacements prevented by, 161
— retrodisplacements, illus., 20
Monstrosities, hereditary syphilis and, 67
Morbidity, motherhood and, 5
— prenatal care and, 16
— puerperal infections and, 90
— vaginal examinations and, 96
Morphin, abruptio placentæ and, 55, 56
— acute decompensation and, 32
— cardiac cases at labor and, 33
— convulsions and, 38
— labor anesthesia and, tuberculosis and, 29
— placenta prævia and, 58
— placental separation and, 55
— shock after labor and, 134
Mortality, infant, age rates, 7, 8
— — breast feeding and, 140
— — causes of, 7, 14, 149
— — early, causes of, 6, 7
— — enlarged thymus and, 138
— — factory day nurseries and, 156
— — falx and tentorium rupture causing, 117
— — hemorrhages of central nervous system causing, 118, 119, 120
— — prenatal care and, clinical reports of, 10-13
— — seasonal, 4
— — sepsis causing, 98
— — spinal injuries causing, 121
— — syphilis causing, 7, 64, 65, 77, 84
— maternal, acute yellow atrophy causing, syphilis and, 80
Mortality, maternal, anesthesia causing, acidosis and, 130, 131
— — asepsis and, 86
— — cesarean section and, 92
— — conception, frequency of, 6
— — eclampsia and, 39, 92
— — midwives' responsibility for, 153
— — milk leg and, 94
— — miscarriage and, 47
— — obstetrical technic and, 150
— — placenta and, manual removal of, sepsis in, 97
— — prenatal care and rate of, 10-13, 90
— — puerperal sepsis and, 4, 86, 90, 101, 104
— — rates, 2-5
— — sepsis and rate of, 98
— — shock at labor and, 130, 131
— — thrombophlebitis and, 104
Mother, pregnant, clothes for, 162
— prenatal care of, 1, 16-62
— syphilitic infection through, fetus and, 64, 66
— Wassermann reaction in, 78
Mother's helper, prenatal care and, 155
Motoring, pregnancy and, 24, 168
— abortion and, 45
Moulding, head, birth injuries due to, 112
Mouth, rhagades at, syphilitic infants and, 75
Movements, fetal, cessation of, death in utero and, 50
Mucous membranes, nasal, syphilitic infants and, 75
Mucus, newborn and, 136
Multiparæ, abruptio placentæ in, 52
— induction of labor in, 108, 109
Municipal nurses, maternity protection and, 155
Murmurs, heart, diastolic, 31
— — presystolic, 31
— — systolic, 30
Muscles, heart, pregnancy and, 31
— rigidity of, pregnancy and, 18
Myoma, uterine, pregnancy and, illus., 44, 45, 46, 51
— hemorrhage and, fatal, 11

Myoma, prenatal care and, 42
Myomectomy during pregnancy, 42

Nap, daily, nursing mothers and, 142
Nasal mucous membranes, syphilitic infants and, 75
Nausea, pregnancy and, 25, 26, 108
Necrosis, symptoms of, pregnancy and, 44
Neighborhood guilds, prenatal care and, 156
Neo-arsphenamin, treatment of syphilitics and, 82
Neonatal deaths, 2
— causes of, 8
— — syphilis, 63, 79
— — traumatism at labor, 111
— prenatal care and, 12
— spinal injuries and, 121
Neonatal management, 136-149
— hemorrhagic tendencies and, 138
— infant care in, 136
— mastitis and, 147
— nursing and, 139
Neosalvarsan, treatment of congenitally syphilitic infants and, 83
Nephritis, chronic, pregnancy and, 22
— abruptio placentæ and, 52
— fetal death and, 48
— maternal deaths due to, 5
— toxemia and, 37
Nervous system, central, newborn, hemorrhage in, 118, 119, 120
— injuries at birth and, 124, 125
— prenatal care and, 39-41
— tension and, 24
— — breast milk and, 144
Neuralgia, stomach, pregnancy and, 168
Neuralgic pain, toxemias of pregnancy and, 37
Neurotic heart, pregnancy and, 31
Neurotic women, anesthesia during labor in, 33
Newborn, abnormalities of, 137, 138, 149
— asphyxia of, 137, 170
— care of, 8, 136-139, 171-174
— clothes and supplies for, 169, 171
Newborn, congenital syphilis in, treatment of, 83
— crying of, 137, 145
— eyes of, care of, 62, 137, 169
— fractures in, 121, 124, 127
— — arm, 123
— — clavicular, 121, 123
— — paralysis and, 127
— — treatment of, illus., 123
— hemorrhages of, central nervous system, 118, 119, 120
— hemorrhagic disease of, confusing the diagnosis of syphilis, 63
— postnatal examination of, 160
— premature, breast milk supply for, 157
— — prenatal care and, 7
— — syphilis and, 79
— syphilitic infection of, 63-66, 76
— — osteochondritis and, 70-73
— — treatment of, 81-83
— — Wassermann reaction and, 78
New York City Department of Health, maternity protection campaign of, 155
Nipples, mother's, care of, 141, 142, 172
— — cracked, treatment of, 143
— — manual expression of, 142, 143, 145, 146
— — shields for, 143
— nursing, 171
Nitrogen partition examination, high blood-pressure of pregnancy and, 22
Nitroglycerin, acute decompensation and, 32
Nuchal arm injuries at birth, 121, 123
Nucleic acid injections, puerperal sepsis treated with, 103
Nurseries, day, factories and, 156
Nurses, maternity, 157, 161, 165, 174
— — factory day nurseries and, 156
— — prenatal care and, 10
— — training for, 159
— public health, maternity care and, 17, 155, 158, 174, 175
— — midwives and, 154
— septic patients and, 98
— wet, 157
Nursing, 139-148

Nursing, colic and, 145
— contraindicated in tuberculous women, 26, 29
— early neonatal, 136
— rest of mother at, 161
— syphilitic infants and, 66
Nutrition, infant, breast feeding and, 139-148

Obstetrician, asepsis of, 86
— induction of labor by, 110
— nursing instructions by, 139, 141
— trained, 18, 42, 149, 150, 158, 162
Obstetric package, sterile, 170
Obstetrics, complications of, 151
— hospital, 154, 158, 162
— infant deaths due to, 8
— prenatal care and, 16
— teaching of, improvement in, 16, 112, 150
Ocular disturbances, eclampsia and, 39.
— congenital syphilis and, 76
— gonococcal infection and, 62, 94
— pregnancy and, 168
— — toxemias of, 37
— prenatal care and, 16
Operations, pregnancy and, abortion following, 41
Operative delivery, birth injuries and, 111, 128
— dystocia and, 19
— inertia necessitating, 91
— pelvic examination and, 19
— sepsis following, 87, 90, 91, 104
— shock prevention and, 131
Ophthalmia neonatorum, gonorrhea and, 61
— prenatal care preventing, 16
Opium, myomectomy and, 42
— ovariotomies and, 42
— in ovariotomies, 41
Ossification, bone, syphilitic infants and, 71
Osteitis, chronic, aural, congenital syphilis and, 76
— saber tibia and, syphilis and, 73
Osteochondritis, syphilitic infants and, 70-73
Osteoplastic flap resection, head injuries at birth and, 113
Ovarian tubes, excision of, sterilization of the tuberculous and, 29
— gonorrhea and, 61, 88, 94
— puerperal fever and, 95
Ovaries, cystic, 41
— — illus., 43
— gonorrhea and, 61
— irradiation of, fetal abnormalities caused by, 67
— syphilis and, 67
— tumors of, 41
Ovariotomy, 41
Ovum, syphilitic infection of, 64, 66, 67

Packing, vaginal, 97
— abortion and, 29, 47
— asepsis of, 135
— placenta prævia and, 60
— tamponage, 29
— — abortion and, 48
— — abruptio placentæ and, 32, 56
— — labor induction and, 110
— — placenta prævia, 59, 60
Pads used during labor, 170
Pain, abruptio placentæ and, 54, 55
— acute cystoma and, 42
— breast feeding and, 140
— fibromyomata and, 44
— heart, 30, 31
— lower back, 169
— neuralgic, toxemias and, 37
— premature initiation of, 109
— prenatal care and, 45
Palate, cleft, hereditary syphilis and, 67
Palpitation, pregnancy and, 30
Palsy, birth, brachial, 124, 125
— obstetrical, due to pressure, 125
Paralysis, newborn, diagnosis of, 127
— — Duchenne's, 124
— — Erb's, 124
— — facial, 127
Parametritis, 89
— milk injections in, 103
— symptoms of, 93
Paraplegia, spastic, obstetrical history of, 114
Parentage, syphilitic, fetal lesions due to, 64-66

Parenthood, training for, 3, 15
Parietal bone, birth injuries of, 113
Pasteurized milk, infant feeding and, 146
Pectoralis major, paralysis at birth of, 125
Pediatric clinics, prenatal care and, 156
Peeling, skin, syphilitic infants and, 75
Pelvic cellulitis, postpartum care of, 161
— puerperal infections and, 89, 93
— ulcer causing, 88
Pelvic tumors, 41-44
— abortion and, 45
— examination of, 18
Pelvis, abnormalities of, pregnancy and labor, 15, 18
— congestion of, abortion causing, 6
— contracted, birth injuries due to, 121
— — facial paralysis and, 127
— — induction of premature labor and, 106
— examination of, 18, 160
— fetal head in relation to, 128
— flat, birth injuries due to, 113
— gonococcal infection of, 88
— infection of, contraindicating induction of premature labor, 106
— — obstetrical, milk injections in, 103
— pain in, prenatal care and, 45
Pemphigus syphiliticus, 75
Peptonuria, fetal death in utero and, 50
Perforation, uterus, abortion and, 47
Perinephritic abscess, pregnancy and, 35
Perineum, infected, local treatment of, 98
— lacerations of, repair, 97
— repaired, postpartum care of, 161
Periostitis, long bones in childhood and, hereditary syphilis and, 73
Peritoneum, puerperal infections of, 93
Peritonitis, bacteremia and, 94
— gonococcal infection and, 94
— postpartum care of, 161
— puerperal infection causing, 88, 89
— retrodisplacements and, 19
Peritonitis, uterine misplacements and, 20, 21
Peri-uterine inflammation, bacteremia and, 94
Pessary, postpartum cases and, 161
— retrodisplacement and, 20
Philanthropic organizations, prenatal clinics and, 156
Phlebotomy, acute decompensation and, 32
Phlegmasia alba dolens, 94
Phthisis, fibroid pregnancy and, 27
Physical examination, pregnant patients and, 160
Physician, obstetrical training of, 150, 151
Pitcher douching, labor and, 95
Pituitrin, abortion and, 47
— abruptio placentæ and, 56
— sapremia and, 93
Placenta, Credé technic in expressing, infections due to, 91, 94, 97
— hemorrhages of, 51-61
— — fetal death due to, 9
— infection of, early rupture of the membranes causing, 96
— manual removal of, sepsis and, 91, 97
— normal, illus., 70
— position of, abortions and, 45
— premature separation of, illus., 52-54, 57-59
— — fetal death and, 48
— — hemorrhage and, 51-61
— — maternal death due to, 11
— puerperal infections and, 88, 89, 91, 94
— syphilitic, 68-69
— — fetal infection by, 66
— — illus., 71
— — laboratory examination of, 68
— — newborn and, 78
— thrombophlebitis and, 94
— thrombosis, death in utero and, 107
— tuberculosis and, 26
Placenta marginata, abruptio placentæ and, 52
Placenta prævia, bag technic in, 109
— blood transfusion in, 104
— differential diagnosis and, 55
— fetal death and, 48

Placenta prævia, illus., 58, 59
— hemorrhage and, 12, 51, 91
— prenatal care and, 12, 56-61
— shock and, 133
— tamponage in, 110
— treatment of, 58
Placental lobules, removal of, 92
Pneumococcic serum, 99
Pneumonia, bronchial, thrombophlebitis causing, 94
— fetal death and, 48
— postpartum, 2
Polyhydramnios, induction of labor and, 108
Polyvalent antistreptococcic serum, 99, 101, 103
Postgraduate obstetrics, need for, 150
Postmortems, puerperal infections originating at, 86
Postnatal death, 9
Postnatal examination of baby, 160
Postnatal syphilis, fetal death due to, 63
Postpartum cases, care of, 160
— examination of, 160
— gonococcal infection in, 88
— hygiene of, 95
— nursing in, 140
— pyelitis and, 35
— tuberculosis in, 27
— uterine infections in, 92
Postpartum hemorrhage, Credé technic and, 97
— myomata with, maternal death from, 11
— shock and, 130
— — chart, 134
Postpartum pneumonia, 2
Potassium citrate, pyelitis of pregnancy treated with, 36
Potassium permanganate, gonorrhea of pregnancy treated with, 61, 62
Potatoes, diet of pregnancy and, 165
Poultices, flaxseed, nausea of pregnancy and, 25
Practitioners, medical, obstetrical training of, 151
— prenatal care and, 10
Pre-eclampsia, toxemia and, 131
Pregnancy, abnormalities of, 17
— abscesses in, 35, 88
Pregnancy, accidents of, maternal death-rate in, 4
— acidosis in, 130, 131
— after-care of, 28
— albuminuria in, 4, 21, 35, 37, 38, 49
— asepsis of, 86, 95, 96
— blood-pressure and, 22, 160, 162
— breast hygiene in, 141, 157
— civic protection of mothers during, 17, 155
— clothes for, 162
— constipation during, 166
— convalescence and, 160
— cysts in, ovary, 41
— danger signals of, 168
— deaths due to, maternal, 2, 5
— diet of, 22-25, 164
— digestion and, 24
— ectopic, secondary shock and, 133
— examination of, 17-22, 160
— exercise during, 168
— — corrective, 160, 161
— gonococcal infection during, 88
— — treatment of, 61, 62
— heart disease and, 29-34
— hemorrhage in, 50
— — calcium in prevention of, 139
— hygiene of, 28, 95, 156
— instructions and, labor, 160, 161, 170
— intestinal care and, 25
— kidney conditions and, 21, 166
— legislation regulating employment during, 156
— liver conditions of, 21
— medical complications of, 25-62
— menstruation periods during, 162
— miscarriages, prevention of, 162
— mitral stenosis and, 30, 32
— nausea of, 25, 26, 168
— nervous disorders and, prenatal care in, 39-41
— nipples in, care of, 141
— placenta prævia and, 56-61
— postural treatment in, 19, 20, 35, 161, 168
— psychoses and, 39, 107, 169
— pyelitis and, 34-36
— pyelonephritis and, 35
— rest during, 21, 24, 32, 46, 47, 142, 161, 162, 167

Pregnancy, skin during, care of, 167
— supervision plan during, 16, 161, 169, 170
— supplies for, 170
— syphilis in, 63-84
— teeth in, care of, 166
— termination of, 18, 47
— — cardiac disease and, 31, 33
— — nervous disorders and, 40
— — pyelitis and, 36
— — syphilis and, 79
— — tuberculosis and, 28, 80-84
— toxemias of, abruptio placentæ and, 52
— — acidosis with, 130-133
— — chronic, high blood-pressure in, 22
— — convulsions and, 10
— — death in utero caused by, 107
— — fetal death and, 9, 48
— — intestinal care and, 25
— — maternal deaths due to, 4, 5, 11
— — nausea and vomiting in, 25
— — placental separation and, 55
— — premature labor induction in, 107, 131
— — prenatal care and, 10, 11, 15, 16, 36-39, 150
— — puerperal infections due to, 91
— — shock at labor caused by, 130, 131
— — syphilis and, 75, 80
— — Wassermann reaction in, 76
— tuberculosis and, 26-29
— — treatment of, 27
— tumors and, ovary, 41
— urinalysis and, 21, 160, 162
— uterine myomata and, 42
— vaginal smear and, 160
— varicose veins and, 167, 168
— Wassermann reaction in, 76, 77, 160
— — chart, 69
— weight, 24
Prematurity, breast milk supply and, 157
— Census reports of, 2
— delivery and, uterine myomata and, 42
— early infant death caused by, 6, 7
— fetal death due to, 9
Prematurity, hemorrhage and, newborn, 138
— hereditary, calcium in, 23
— labor and, cardiac cases and, 33
— — conservatism and, 19
— — death in utero prevented by, 49
— — induction of, 106-110
— — prenatal care preventing, 12, 15, 149
— — syphilis causing, 79
— prenatal care reducing, 7, 44, 150
— syphilis and, 79
— toxemias of pregnancy causing, 7
Prenatal care, 1-14
— abortions and, 7, 44-48
— diet of pregnancy and, 22-25
— essentials of, 15-62
— examination of patient and, 17-22
— exhibits and, public health, 157
— medical complications of pregnancy and, 25-62
— organized, 12-14
— prematurity and, 7
— public health and, 149-175
— — directions for mothers, 161
— — infant care, 173
— — midwife and, 151, 154
— — New York City plan for, 155
— purposes of, 15
— sepsis and, 5
— syphilitic infant deaths reduced by, 64, 82
Prenatal clinics, 10-14
— doctors' duties at, 160
— maternity protection and, 156
— Wassermann reaction reports in, 77
Prenatal hygiene, 10
Pressure, abnormal, birth injuries and, 112
— cranial, deaths due to, 117
— intra-abdominal, 131
— intracranial, 113
— — blood injections in, 115
— — facial paralysis and, 128
Prevention, prenatal care and, 1, 9, 10, 15-62
Primipara, induction of labor in, 109
Profeta's law, syphilitic infections and, 66
Prolapse, prevention of, 160

Prostration, pregnancy and, cystoma and, 42
Protection, mother and child, prenatal care and, 149-175
Protein therapy, puerperal sepsis and, 103
Prunes, constipation during pregnancy and, 166
Psychoses, parturition and, 6, 107
Public health, exhibits and, 157
— midwife and, 154
— nurses and, maternity work of, 159, 174, 175
— prenatal care and, 2, 149-175
Puerperal hemorrhage, maternal deaths due to, 4
Puerperal infections, 86-105
— abortion and, 6, 43, 47
— bacteriology of, 87
— blood transfusion, dosage, 103, 104
— Census reports of, 2
— charts, illus., 100, 102
— chemical treatment of, 104
— eclampsia and, 92
— endometritis and, 93
— frequency of, 90
— gonococcus causing, 61, 94
— hygienic prevention of, 95, 96
— labor followed by, 150
— leukocyte count in, 101
— maternal deaths due to, 4, 5, 11, 86
— metritis and, 93
— midwives' responsibility in, 153
— miscarriage and, 47
— mortality rates in, 90
— operative treatment of, 91, 104
— pathology of, 88
— placental, 91, 94
— predisposing causes of, 91-95
— prenatal care and, 5, 12
— protein therapy and, 103
— serums in, 99-103
— specific treatment of, 99
— Staphylococcus aureus causing, 87
— streptococcus causing, 87
— symptomatology of, 93
— thrombophlebitis and, 94
— thrombosis and, 89
— treatment of, 95-104
Puerperal insanity, 40
Puerperal sepsis, 86-105
Puerperal ulcer, 88
Puffiness, ankle and foot, pregnancy and, 162
— eye, pregnancy and, 168
— toxemias and, 37
Pulmonary embolism, maternal death from, 11, 33
Pulse, abruptio placentæ and, 55
— bounding, convulsions at labor and, 38
— Corrigan, pregnancy and, 31
Pus cells, urine of pregnancy and, 21
— puerperal infections and, 87
— pyelitis cases and, 35, 36
Pyelitis, pregnancy and, 25, 34-36
Pyelonephritis, pregnancy and, 35
Pyemia, labor followed by, 93, 94
Pyogenic cord infections, fetal death and, 48

Quinin, abortion and, 47
— induction of labor with, 110

Race, syphilis and, 77
Rectal anesthesia, labor of cardiac cases and, 33
Rectal examinations, pregnancy and, 160
— gonorrhea and, 62
— sepsis caused by, 96
Red blood cells, toxemias of pregnancy and, 37
Renal conditions, pregnancy and, 6, 18
— — care of, 32, 166
— — death in utero and, 107
— — eclampsia and, 39
— — history and, patient's, 17
— — urine analysis and, 18, 21, 160, 162, 165
— — puerperal sepsis and, 91
— — pyelitis in, 34, 35
Respiration, newborn, 136, 137
Rest, pregnancy and, 21, 24, 32, 46, 47, 142, 161, 162, 167
Retinitis, eclampsia and, 39
Retrodisplacements, uterine, 19, 161
Retroplacental blood, Wassermann reaction of, 76
Retroversion, prevention of, 160

Rhagades, syphilitic infants and, 75
Rheumatic fever, pregnancy and, 31
Rickets, breast feeding and, 140
— syphilitic osteochondritis and, 72
Rubber bag technic, induction of labor and, 38, 108, 109
— abruptio placentæ and, 56
— cardiac cases and, 33
— cervix dilatation and, 32
— placenta prævia and, 59
Rupture, membrane, infection following, 96
— uterus, shock and, 133
— vein, birth and, 112
Rural communities, maternity protection in, 158, 159
— midwives in, 152
— mortality rate from sepsis in, 90

Saber tibia, osteitis in childhood and, 73
Saline infusion, placental hemorrhage and, 56, 60
— shock prevention and, 131
Salpingitis, uterine misplacement and, 21
Salt elimination, toxemias of pregnancy and, 37
Salvarsan, syphilis during pregnancy and, 81
Sandalwood oil, pyelitis of pregnancy and, 36
Sandbag, abdominal, primary shock and, 133
Sapremia, puerperal, bacteria causing, 88
— — decidua and, 89
— — lochia and, 88
— — postpartum uterus and, 92
— — symptomatology of, 93
Scalp, edema of, birth, 112
Scarlet fever, pregnancy and, 17
— fetal death and, 48
— puerperal infections originating from, 86
Scleroderma, hereditary syphilis and, 67
Scopolamin, labor anesthesia and, 29, 33
Scurvy, breast feeding and, 140
Secundines, removal, infections and, 92
Self-control, labor and, 169
Senna leaves, constipation during pregnancy and, 166
Sensitization tests, pregnancy and, 101, 103
Sepsis, puerperal, 86-105
— — abortion and, 6, 43, 47
— — bacteriology of, 87
— — blood transfusion, dosage, 103, 104
— — Census reports of, 2
— — charts, illus., 100, 102, 114
— — chemical treatment of, 104
— — eclampsia and, 92
— — endometritis and, 93
— — frequency of, 90
— — gonococcus causing, 61, 94
— — hygienic prevention of, 95, 96
— — labor followed by, 150
— — leukocyte count in, 101
— — maternal deaths due to, 4, 5, 11, 86
— — metritis and, 93
— — midwives' responsibility in, 153
— — miscarriage and, 47
— — mortality rates in, 90
— — operative treatment of, 91, 104
— — pathology of, 88
— — placental, 91, 94
— — predisposing causes of, 91-95
— — prenatal care and, 5, 12
— — protein therapy and, 103
— — serums in, 99-103
— — specific treatment of, 99
— — Staphylococcus aureus causing, 87
— —streptococcus causing, 87
— — symptomatology of, 93
— — thrombophlebitis and, 94
— — thrombosis and, 89
— — treatment of, 95-104
Septicemia, puerperal, labor and, 86, 88
— — causes, 90, 91
Serum, blood injections or, intracranial pressure at birth and, 116
— horse, streptococcic infection and, 101
— pneumonococcic, 99

Serum, polyvalent antistreptococcic, 99, 101, 103
— prevention of sepsis and, 99-103
— puerperal sepsis and, 87
— — dosage, 101
Serum sickness, puerperal sepsis and, 101
Sewing machine, use of, pregnancy and, 24
Sexual relations, pregnancy and, 20, 45, 95, 161
— syphilitic's, regulation of, 67, 81
Shelters, confinement, public, 157
Shock, labor and, 150
— abortion and, 43
— abruptio placentæ and, 55
— accidents of labor and, 130-135
— — charts, illus., 133, 134
— acidotic, 130-133
— blood-pressure in, 131
— causes of, 130
— infections and, 91
— placenta prævia and, 57
— primary, 130
— secondary, 133
Shoes, pregnancy and, 162
Shoulder delivery, 121, 122, 123, 128
— fractures, 127
— subluxation, birth palsy due to, 124
— technic, 128
Sight, blurring, pregnancy and, 168
Silver nitrate, eyes and, newborn, 62, 137, 169
— gonorrhea treated with, 62
— nipple cracks treated with, 143
Sims' position, varicosities during pregnancy and, 168
Size, fetal, 17, 19
— parents', labor and, 19
Skin, blueness of, neonatal, 137
— care of, pregnancy and, 167
— chilling of, neonatal, 138
— syphilitic condition of, neonatal, 75
Skull injuries, forceps extraction and, 116
Sleep, infant's, 174
Smallpox, fetal death and, 48
Smellie-Veit breech delivery, 118, 121
Smoking, pregnancy and, 24, 165
Snuffles, syphilitic infants and, 75
Social service workers, maternity, 155, 174
Soda, bicarbonate, nausea and, 25
— — pregnancy and, convulsions in, 37
— — pyelitis and, 36
— — toxemia and, 131
Sodium bromid, tachycardia and, 33
Sodium phosphate, pyelitis of pregnancy and, 36
Souffle, umbilical, fetal death in utero and, 50
Soup, diet of pregnancy and, 23
Spanking method at birth, 136
Spastic paraplegia, obstetrical history of, 114
Specific gravity, uric, pregnancy and, 21
Spermatozoön, syphilitic infection of, 64, 66, 67
Spina bifida, hereditary syphilis and, 67
Spinal canal, facial paralysis and, 128
— hemorrhage in, 118
Spinal cord, injuries to, birth, 117, 118, 137, 150
— — breech delivery and, 8
— — hemorrhages, 117, 120, 122
— — vertex delivery and, 117
Spinal fluid, bloody, newborn and, 120
Spinal puncture, newborn and, cerebral hemorrhage in, 138
— congenital syphilis and, 83
Spirochæta pallida, pregnancy and, 76
— liver and, 73-75
— placenta and, 66, 68
— syphilis transmission theories and, 64
Spleen enlargement, syphilitic infants and, 73, 75
Splitting, skin, syphilitic infants and, 75
Sponge stick, placental lobules removed by, 92
Staining, blood, pregnancy and, 47, 50, 169
— placenta prævia and, 58
— prenatal care and, 15
Starchy foods, diet of pregnancy and, 165
Starvation, labor and, 130

Starvation, eclampsia and, 39
State requirements, midwifery, 152, 153
— obstretrical practice and, 150
Steinke splint, arm fractures of the newborn and, 124
— illus., 125
Sterility, one-child, 6
— gonorrhea and, 61
Sterilization, tuberculous women and, 29
Stillbirths, autopsy of, 9
— breech deliveries and, 117
— causes, 8
— Census reports, 2
— cerebral hemorrhage and, 112
— frequency of conception and, 6
— history, patient's, 17
— reduction of, prenatal care and, 10, 12, 81, 82, 84
— spinal injuries and, 121
— syphilis and, 63, 64, 77, 79, 84
— — prenatal care and, 81, 82, 84
— tears of the falx and tentorium, 117
— traumatism at labor and, 111
Stockings, pregnancy and, 162
Stomach, neuralgic pains in, pregnancy and, 168
Stools, infant, feeding and, 145, 146
Strain, pregnancy and, 168
Strawberries, contraindicated in diet of pregnancy, 24, 165
Streptococcemia, postabortal hemolytic, serum treatment and, 103
Streptococcic infections, pregnancy and, bacteremia in, 93
— — endometritis in, causes of, 95
— hemolytic, bacteremia and, 103
— — intestinal, sepsis at labor due to, 5
— — serum treatment of, 101, 103
— non-hemolytic, puerperal infections with, 87
— — bacteremia and, 93
— polyvalent serum treatment of, 99, 101, 103
— puerperal, 87
— — blood transfusion in, 104
— — symptomatology of, 93
— pyogenic, puerperal infections with, 87
Streptococcic infections, uterine, 85
— vaginal, percentages, 95
Streptococcus, animals infected with, horse serum and, 101
Streptococcus mucosus, puerperal infections and, 87
Stroganoff treatment, convulsions at labor and, 38
Students, medical, obstetrical requirements of, 150
Subluxation, bone, birth palsies and, 124
Sugar, breast milk, colic and, 145
— feeding and, newborn, 142
— shock prevention after labor and, 131
— urine and, pregnancy, 21
Sunlight treatment, sepsis and, 98
Supplies, labor and nursery, 170, 171
Surgical shock, labor and, 133
Sutures, repair of lacerations and, 89
Sweets, diet of pregnancy and, 165
Swelling, extremities and, 94, 168
Syphilis, conceptional, 65, 66
— congenital, bone lesions in, 63, 70-73, 76
— — ear conditions due to, 76
— — eye conditions due to, 76
— — infant deaths due to, 64, 65, 77
— — prenatal care and, 14
— — teeth conditions due to, 76
— — test for, living child, 78
— — treatment of, 81, 83
— fetal, 49
— hereditary, 66-78
— — bulbo-medullary hemorrhages in, newborn and, 120
— — necrosis from, epiphyseal line, 72
— — pathology of, 68
— — symptomatology of, 76
— postconceptional, 65
— pregnancy and, 63-84
— — abortion and, 78
— — abruptio placentæ in, 52
— — drug administration in, 80
— — fetal death due to, 9, 48, 63
— — hemorrhage and, newborn, 138
— — incidence of, 77
— — infant death due to, 7, 63
— — maceration caused by, 49

Syphilis, pregnancy and, prenatal care and, 12, 15, 84, 150
—— results of, 78-80
—— spontaneous cure of, 76
—— transmission and, 64-66
—— treatment of, 80-84
—— viscera and, infant, 73-75
—— Wassermann reaction and, 76-78
Syphilitic infection, newborn, methods of, 64, 65, 66
— spermatozoön, 64, 66, 67
Syphilitic pemphigus, 75
Syphilitics, marital relations of, regulation of, 67, 81
Systolic murmurs, pregnancy and, 30

Tachycardia, heart disease differentiated from, 33
Tamponage, uterine, 29
—— abortion and, 48
—— abruptio placentæ, 32, 56
—— labor induction and, 110
—— placenta prævia and, 59, 60
Tea, diet of pregnancy and, 165
— heart conditions and, 32
Teaching obstetrics, maternal protection and, 150
Tears, cervix, abortions and, 45
—— operative delivery and, 91
—— puerperal infections due to, 88, 91
—— repair of, 89, 97
—— ulcer in, 88
— falx, fetal death due to, 117
— forceps extraction, repair of, 89
— liability to, labor and, 96
— septum, breech deliveries with stillbirths and, 117
Technic, aseptic, labor and, 87
Teeth, care of, pregnancy and, 166
— bad, high blood-pressure and, 22
Teeth, newborn, breast feeding and, 140
— congenital syphilis affecting, 76
Temperature, puerperium and, 88
— puerperal infections and, 90, 93, 94
— pyelitis and, 35
Temporal bone injury, facial paralysis and, 127
Tennis, pregnancy and, 25
Tentorium cerebelli, rupture of, birth, 112, 113, 117, 121
—— facial paralysis and, 127
—— fetal death due to, 117
—— illus., 115, 116, 118
Teres minor, paralysis of, birth, 125
Thetford Mines Experiment, prenatal care and, 12
Thigh, fracture of, newborn and, 124
Thrombophlebitis, operative treatment of, 104
— pyemia and, 94
— sepsis due to, 101
— staphylococcus causing, 93
— symptomatology of, 93
— visceral abscesses causing, 94
Thrombosis, placental, cardiac cases and, 33
—— puerperal infections and, 89
— umbilical cord, fetal death and, 48
Thymus, enlarged, newborn and, 138
— hemorrhage of, syphilis differentiated from, 63
Thyroid extract, pregnancy and, arhythmia of, 33
— intestinal care in, 25
— tachycardia of, 33
Thyroprotein injection, nausea of pregnancy and, 25
Tobacco, use of, pregnancy and, 1
Tonsils, infected, high blood-pressure and, pregnancy and, 22
—— pyelitis caused by, 36
Toxemias, pregnancy, 36-39
—— abruptio placentæ and, 52
—— acidosis with, 130-133
—— chronic, high blood-pressure and, 22
—— convulsions and, 10
—— death in utero caused by, 107
—— fetal death and, 9, 48
—— intestinal care and, 25
— maternal deaths due to, 4, 5, 11
— nausea and vomiting in, 25
— placental separation and, 55
— premature labor induction in, 107, 131
— prenatal care and, 10, 11, 15, 16, 36-39, 150
— puerperal infections due to, 91
— shock at labor caused by, 130, 131

Toxemias, syphilis and, 75, 80
— urinary changes in, 37
— Wassermann reaction in, 76
Toxic conditions, maternal breast milk and, 141
— early infant death due to, 7
— heart and, 31
— maceration and, 49
Traction apparatus, fractures and, newborn, 124
Training, parenthood, 3, 12, 15, 149-175
Transfusion, blood, abruptio placentæ and, 56
— — placenta prævia and, 60
— — puerperal sepsis and, 103
— — shock and, labor followed by, 134, 135
— gum glucose, shock and, labor followed by, 134
Transmission, syphilis, 64-66
Traumatism, birth, deaths due to, 111
— abruptio placentæ and, 52
Treponema pallidum, pregnancy and, liver in, 73-75
— — placenta in, 66, 68
— — syphilis transmission theories in, 64
Tuberculosis, pregnancy and labor and, 6, 18, 26-29
— induction and, premature labor, 107
— laryngeal, 27, 28
— patient's history and, 17
— scopolamin anesthesia in labor and, 29
— treatment of, 27
Tubes, ovarian, excision of, sterilization of the tuberculous and, 29
— — gonorrhea and, 61, 88, 94
— — puerperal fever and, 95
Tumors, pelvic, pregnancy and, 18, 41-44
— abortion and, 43, 45
— ovarian, 41, 42
Typhoid, fetal death and, 48

Ulcer, puerperal, 88
Umbilical cord, pressure on, labor and, 150
Urethra, gonorrheal, argyrol treatment of, 61
Urine, analysis, 18, 21, 160, 162, 166
— casts in, 21, 37, 38
— colon bacillus infection and, 88
— pregnancy and, 34
— pyelitis in, 34, 35
— toxemias of, 37
Urotropin, pyelitis of pregnancy and, 36
Uterus, abortion and, 45, 47, 48
— — technic of, 29
— abruptio placentæ and, 52-56
— colon bacillus infection and, 88
— contractions of, 169
— — nursing and, 142
— — Wassermann reaction affected by, 76
— curettage and, 104
— death in, 48-50
— emptying of, 42, 47, 56
— — infections and, 92
— — heart conditions and, 32
— — technic of, 29
—forcible reposition of, 20
— misplacements of, correction of, 19, 20
— myomata of, prenatal care and, 42
— — illus., 44, 51
— perforation of, abortion and, 47
— position of, importance of, 18, 19
— — nausea and vomiting due to, 25
— puerperal, 89, 104
— removal of, lacerations and, 97
— retrodisplacement of, 19
— — abortion and, 45
— ruptures of, shock and, 130, 133
— septic, treatment of, 90, 98, 99
— tamponage of, 48, 59, 60, 110
— tumors of, 41
— staphylococcal infection of, 87
— streptococcal infection of, 89

Vagina, abortion and, care at, 29
— asepsis and, labor, 109
— bacteria in, puerperal sepsis caused by, 87, 88, 91, 94, 95
— colon bacillus in, 88
— drainage of, labor and, 98
— examination of, 160

Vagina, examination of, infections following, 62, 87, 95
— gonorrhea and, argyrol treatment of, 61
— hygiene of, 95
— infections of, 88, 97
—— local treatment of, 98
— lacerations of, 89
—— repair of, 97
— streptococcus in, 87
—— percentage of, 95
— tamponage of, 97, 110
—— abortion and, 48
—— abruptio placentæ and, 56
—— placenta prævia and, 59
Vaginal douche, 48, 61, 95, 96, 109
— puerperal infection contraindicating, 99
Vaginal smear, pregnant cases and, 160
Varicose veins, pregnancy and, 168
— clothes causing, 162
— treatment of, illus., 167
Vascular lesions, bulbo-medullary hemorrhage and, newborn, 120
Vascular supply, interference with, fetal abnormalities caused by, 67
Vegetables, diet of pregnancy and, 23, 165
Veins, varicose, clothes causing, 162
—— pregnancy and, 168
—— treatment of, illus., 167
Venesection, convulsions at labor and, 38
Verruca acuminata, gonorrhea and, 61
Version delivery, abortion and, 43
— abruptio placentæ and, 56
— Braxton-Hicks, placenta prævia and, 60
— cardiac cases and, 33
— collapse in, 131
— conservatism and, 19
— decompensation and, 32
— internal podalic, placenta prævia and, 60
— spinal injuries and, 120, 121
Vertebræ, cervical, fractures of, breech delivery and, 8, 121
—— injuries of, birth, 117, 121
Vertex delivery, birth injuries in, 117
— clavicular fracture in, 121
Viscera, syphilitic infants', 73-75
— Wassermann reaction in, 78
Visceral abscesses, thrombophlebitis causing, 94
Vision, care of, at birth, 62, 137, 169
— congenital syphilis and, 76
— disturbance of, pregnancy and, 168
— prenatal care and, 16
—protection of, gonococcal infection and, 62, 94
— toxemias and, 37
Vomiting, infant feeding and, 145
— pernicious, labor and, 5, 130
—— syphilitics and, 80
— pregnancy and, 25, 26, 168
—— cystoma of, acute, 42
—— toxemias of, 37
Voorhees bag, induction and, labor, 108
— placenta prævia and, 60
Vulva, colon bacillus infection and, 88
— gonorrheal conditions of, 61
—— argyrol treatment of, 62
— preparation of, labor and, 95
— streptococcus infection of, 87, 95
— varicosities of, postural treatment for, 168
Vulvovaginal glands, abscesses of, 62
— gonorrhea and, 61

Walking, pregnancy and, 24, 40
Wassermann reaction, infants and, 81
—— prenatal treatment and, 82
—— syphilitic, 66, 83
— nursing of syphilitic infants and, 66
— pregnant women and, 76-78, 160
—— incidence charts, 65, 69
— sperm studies in relation to, 67
Water, diet of pregnancy and, 164, 166
Wegner's line, x-ray of, test for congenital syphilis and, 78
Weight, infant, breast milk and, 145
— pregnancy and, diet of, 24
Welfare, child, prenatal care and, 6, 11, 12, 15, 150-175
Wet nurses, 157
Wet nursing, children of tuberculous mothers and, 27

Whey, feeding and, newborn, 142
Whining, newborn and, 137
Whiskey, eggnog and, septic patients and, 98
Witch-hazel, nipples and, care of, 143
Womb, contraction of, fear and, 169
— nursing and, 142
— Wassermann reaction affected by, 76
Work, heavy, postpartum uterus and, 161
Worry, pregnancy and, 24
— breast feeding and, 140, 144
Wounds, labor, treatment of, 89, 97, 98

X-ray, gonorrhea and, pregnancy and, 61
— Wegner's line, test for congenital syphilis and, 78

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